SERVICE MANUAL

TT520

marantz®

Model TT520

Turntable

FEATURES

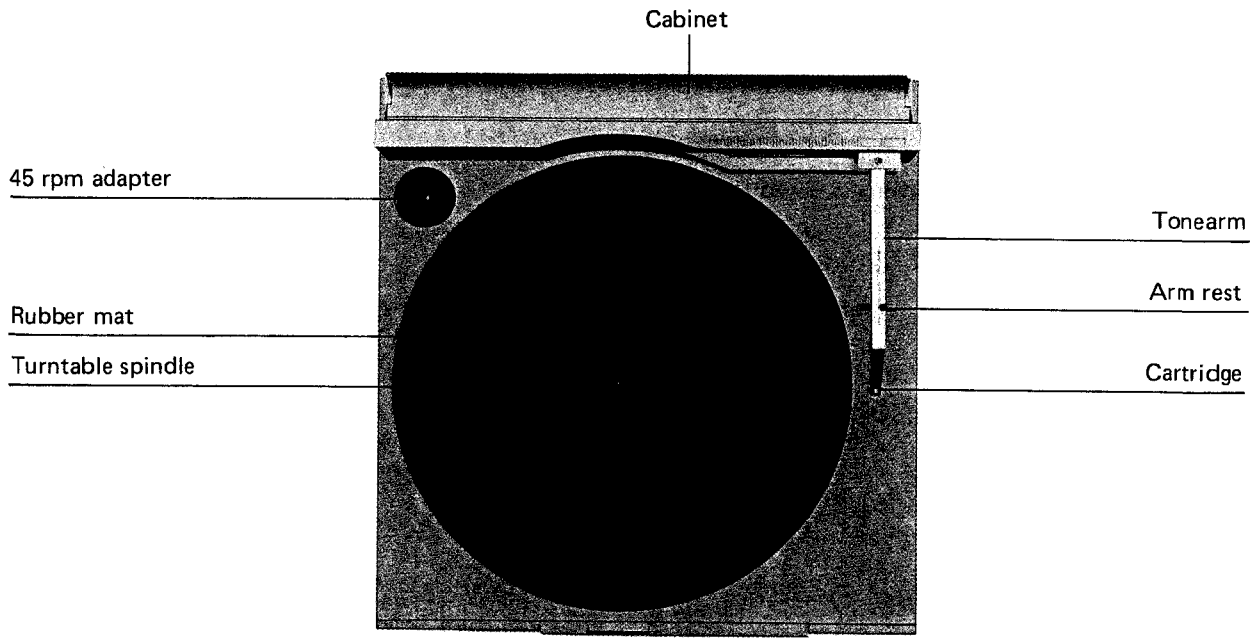
Full-automatic, belt drive, linear tracking with cueing, strobe, pitch control, record size selector, repeat, speed selector, inward and backward.

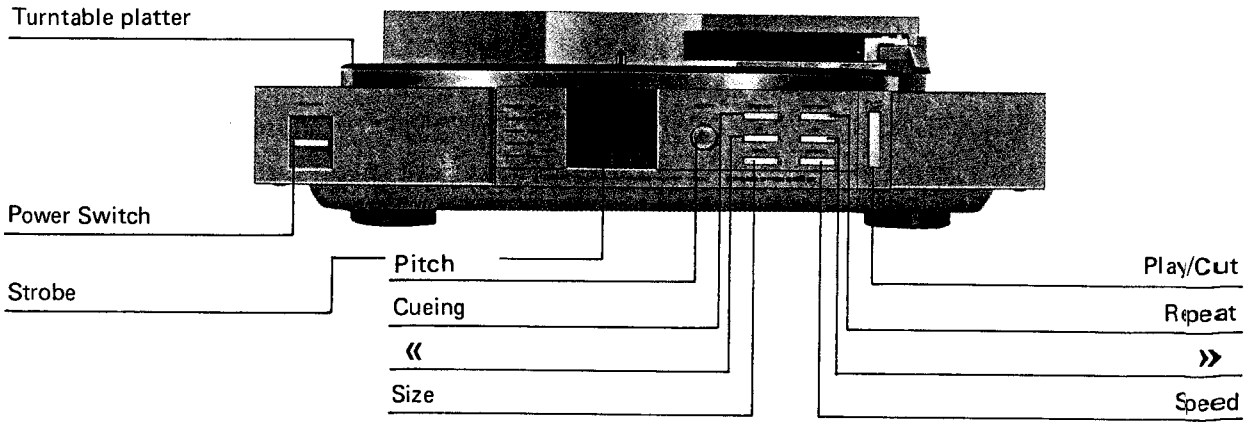
SPECIFICATIONS:

Type	2 speeds, belt drive, linear tracking, automatic turntable
Platter	Aluminum alloy die-cast, 295mm diameter, 0.7kg.
Motor	DC FG servo
Speed	2 speeds; 33-1/3 and 45 rpm
Pitch control range	±3% or more
S/N (DIN B)	58dB or more, Test record: DIN45544, Test equipment: by DIN45531
Wow & Flutter (DIN CCIR)	0.2% or less, Test record: DIN45545, Test equipment: by DIN45507
Tonearm	
Effective length	165±1mm
Cartridge	
Frequency response	20 - 20,000Hz
Output voltage	1.5 - 3.0mV at 1kHz, 35 cm/sec, Test record: TRS-1004
Channel difference	2.5dB or less at 1kHz, Test record: TRS-1004
Channel separation	18dB or more at 1kHz, Test record: TRS-1004
Tracking force	1.5 gram±0.3 gram
Stylus tip	0.6 mil diamond stylus
Power source	100/120/220/240V 50/60Hz, 220V 50Hz for Europe, 240V 50Hz for UK and Australia
Power consumption	10W±25%
Dimensions	350(W) x 365(D) x 118(H) mm
Weight	6.0 kg
Accessories	45 rpm adaptor

NOTE: Nominal Specs represent the design specs; all units should be able to approximate these-some will exceed and some may drop slightly below these specs. Limit specs represent the absolute worst condition which still might be considered acceptable; in no case should a unit perform to less than within any Limit Spec.

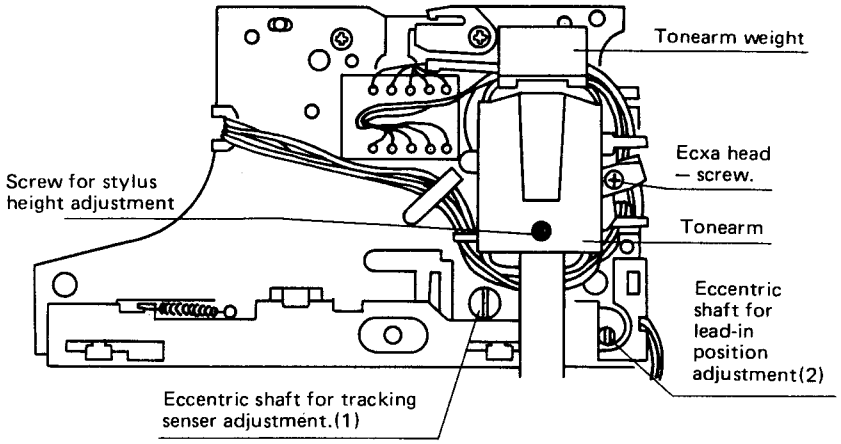
Lubrication of the mechanism is not required. However, whenever a unit is brought in for adjustment or repair, always use good common sense ... clean any dust or dirt from mechanical parts and if moving parts do seem to bind, check for dirt. If necessary, add a very fine film of light-weight specially formulated lubricant.


Cabinet
45 rpm adapter
Tonearm
Arm rest
Rubber mat
Turntable spindle
Cartridge

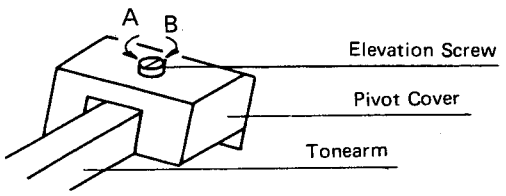

Turntable platter
Power Switch
Strobe
Pitch
Cueing
«
Size
Play/Cut
Repeat
»
Speed

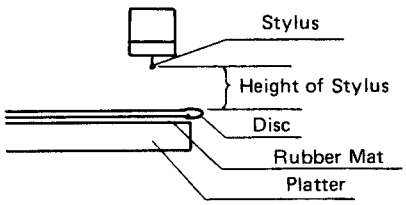
ADJUSTMENT:

1. Adjustment of Lead-in position.
   The Tonearm should perform lead-in motion and descend at 12" position by pushing the PLAY switch ON after setting SIZE Selector to 12".
   To change the descending position, adjust Eccentric Shaft(2) on Tonearm Base so that lead-in descend position occurs within the following tolerances.
   12" Descending position 11.50-11.69in./292-297mm.(from Main Motor shaft) 7" Descending position 6.57-6.77in./167-172mm.
   The 7" lead-in position is fixed by the adjustment for 12", automatically.
   (Lead-in position moves gradually outward by rotating the Eccentric Shaft(2) in a clockwise direction).



2. Adjustment of Stylus height.
   Adjust height of Stylus within 4-7mm from surface of Disc at lead-in and return motion by turning Elevation Screw. The screw for Stylus adjustment is located on Tonearm Pivot Cover.





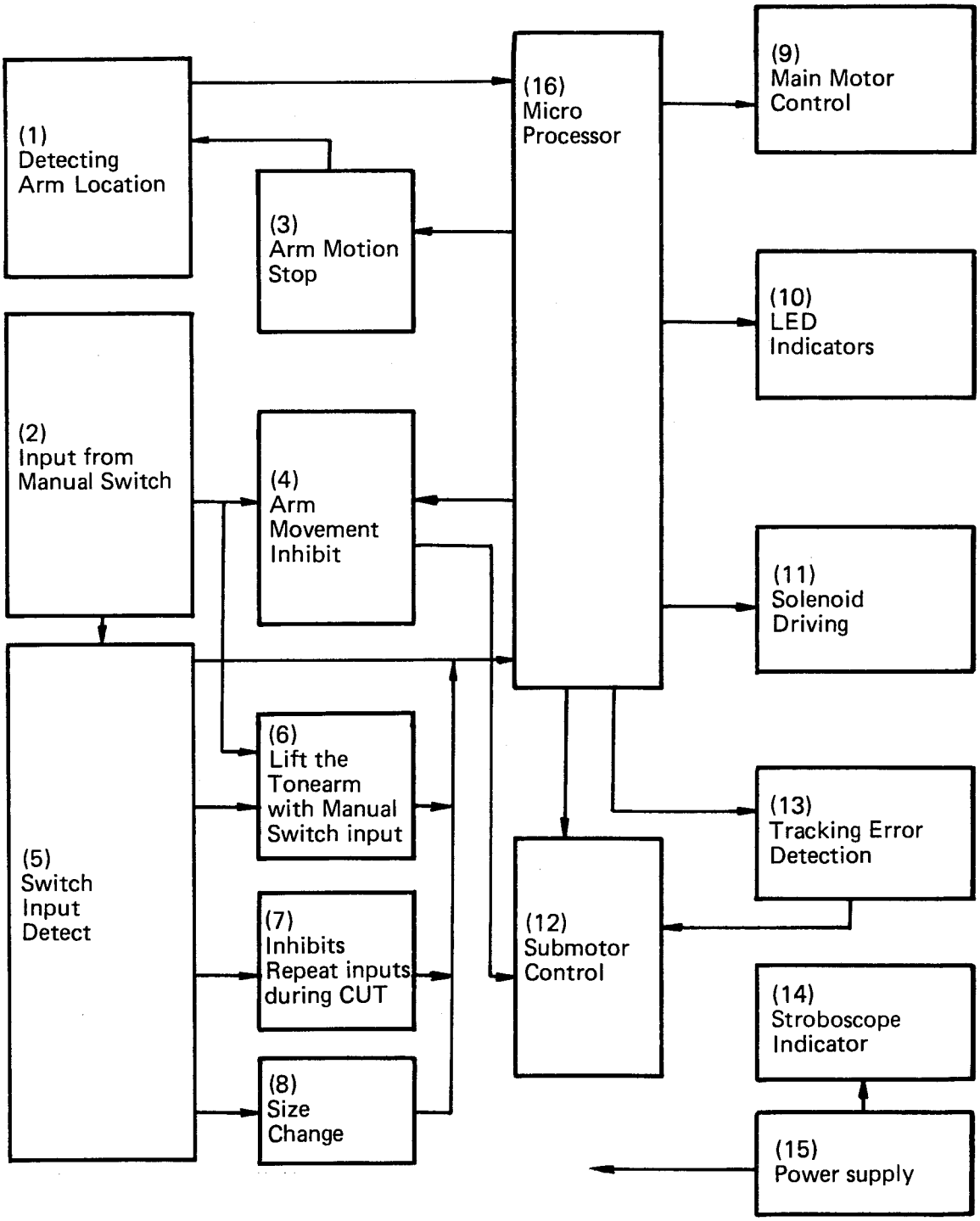
   When height of Stylus is too low, turn Elevation Screw counter-clockwise (direction of arrow A); when it is heigh, turn it clockwise (direction of arrow B).

3. Adjustment of Motor.
   VR3 is to be set 2.5 K ohm.
   EP adjustment is to be done by VR1 (20 K ohm).
   LP adjustment is to be done by VR2 (50 K ohm).

   And then when VR3 is changed from 0 to 5 K ohm, range of adjustment for LP and EP is to be more than ± 3.5%.

PRINCIPLE OF OPERATION FOR CONTROL CIRCUIT

1. Block Diagram



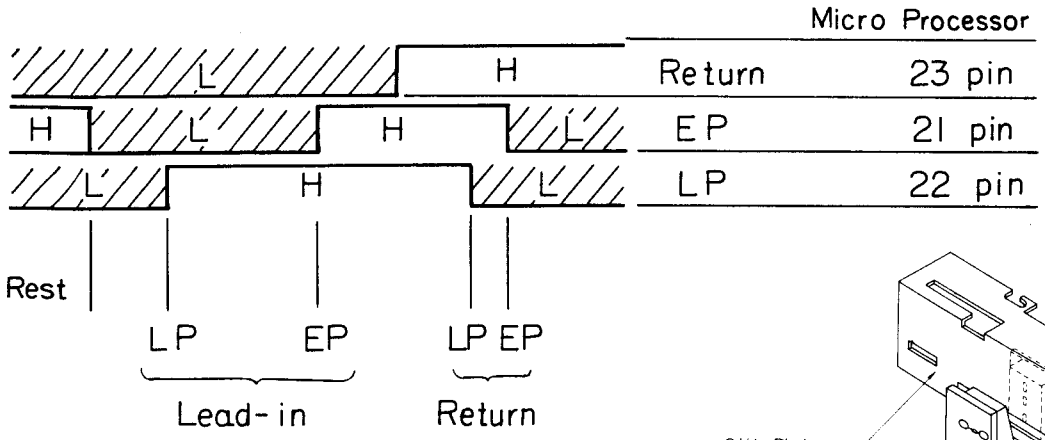
(1) Detecting Arm Location

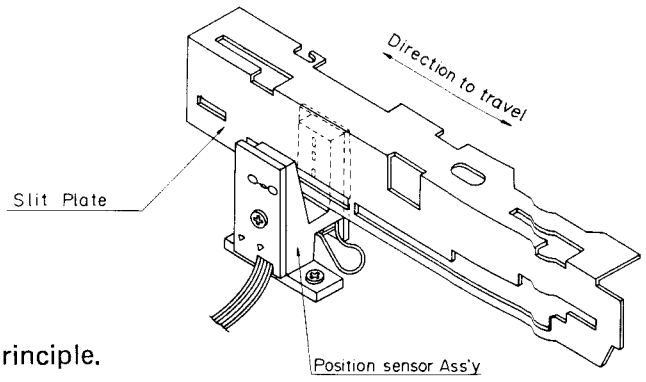
One LED and three photo transistors are employed to detect the arm position. As the tone arm moves, slit plate (44) moves and light from the LED falls on the photo transistor(s) in accordance with the slit on the plate. The lit photo transistor(s) conducts and send signal to microprocessor pins 21, 22 and/or 23.

For example, when the tone arm is at "rest" position, slit plate is on the rightmost position so the left side of the plate is between the LED and photo transistors. As you will see from the illustration, left side of the plate has slit in the middle height position, so the photo transistors on the middle (X119) turns on and send signal (H level) to pin 21 of microprocessor.

The combination of the level at three pins tells the microprocessor the position of tonearm as follows.

Pin 21	Pin 22	Pin 23	Tonearm Position/Movement
L	L	L	Rest to Disc
H	L	L	At rest
H	H	L	12" disc or 7" disc playing
H	H	H	Ditto
H	L	H	12" disc finishes but 7" still playing
L	H	L	12" disc starts but 7" not yet
L	L	H	Returning to rest
L	H	L	– nil –





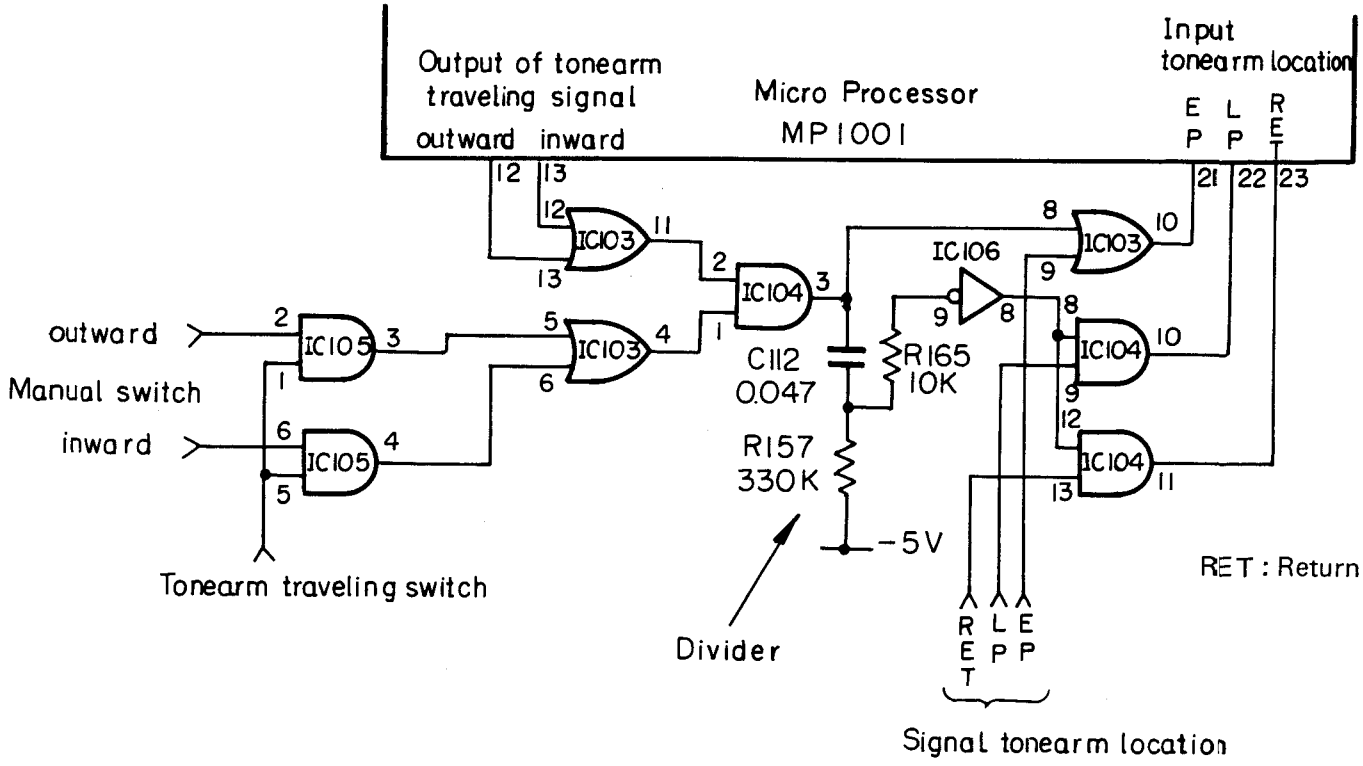
(2) Input from Manual Switch

Detect signals from the manual switches. See Operation Principle.

(3) Arm Motion Stop

When the Manual switch is pressed during automatic movement(either lead-in or return) "tone arm is at rest" signal is fed to the microprocessor and interrupt automatic operation.

When either of Manual switches is pressed, H level appears on either pin 3 or pin 4 of IC105. (Pins1 and 5 of IC105 is H when the tonearm is lifted. See paragraph 4.) It is then ORed and applied to pin 1 of IC104. At the same time, microprocessor outputs H from either Pin 12 or Pin 13, ORed and H is applied to Pin 2 of IC104. Hence the pin 3 of IC104 goes H. It is ORed and H is applied to Pin 21 of microprocessor. The output from IC104 is also applied to inverter IC106, and resulting L is applied to one of the input of two ANDs. Thus Pins 10 and 11 of IC104 go low, pins 22 and 23 of microprocessor go low. According to the chart in para 1), this status (pin 21 = H, pin 22 = L, pin 23 = L) shows "tonearm at rest".

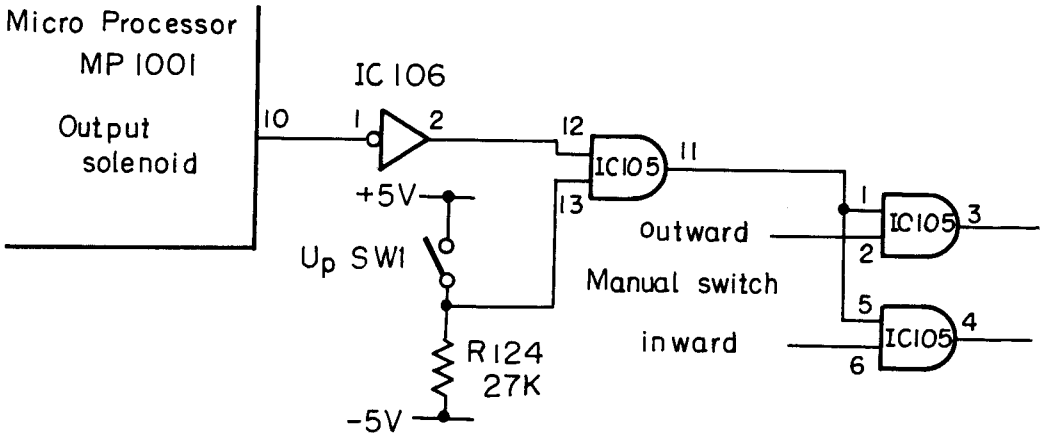


(4) Arm Movement Inhibit

Inhibits movement by Manual switch during the tone arm is descended.

Pin 10 of microprocessor (which keeps solenoid on to have the tone arm in down position) is H during the tonearm is decended. Hence L is applied via inverter to the pin 12 of IC105. Pin 11 of IC105 outputs L, then pins 3 and 4 of IC105 are also L. Thus even either or pins 2 or 6 of IC105 becomes H, outputs of both ANDs are low and therefore manual move signal is inhibited.

(Up SW1 is located inside the tonearm movement block, and is OFF when tonearm is down)



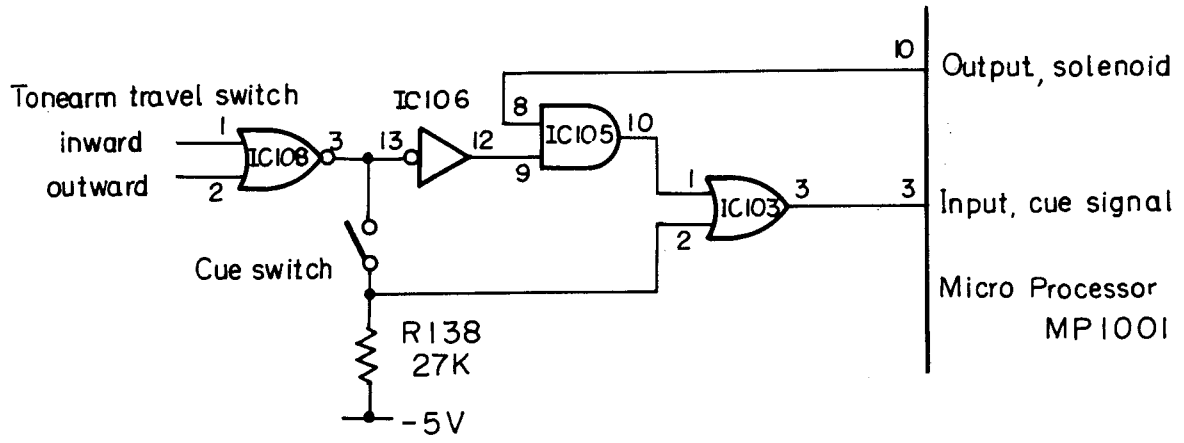
(5) Switch Input Detect

Detects signals from PLAY/CUT, CUE and REPEAT. See Operation Principle.

(6) Lift the Tonearm with Manual Switch Input

The tonearm must first be raised before it moves sideways. (Inhibition of sideway movement during tonearm is down is explained in paragraph 4.)

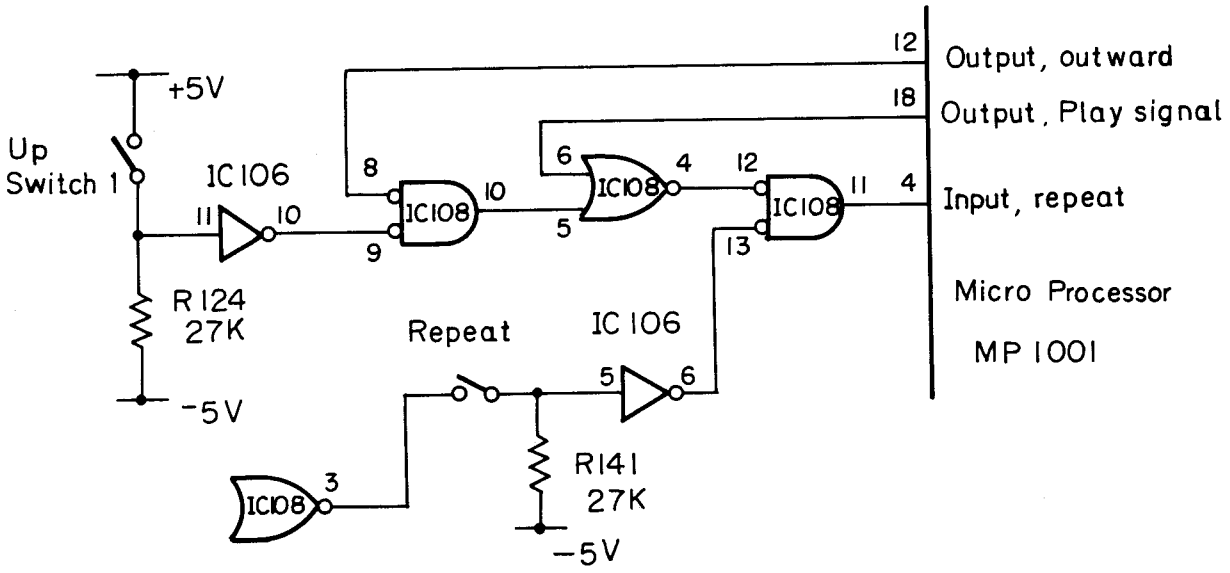
When either of Manual switch is pressed, L appears at pin 3 of IC108, NOR gate. IC106 inverts to H. Since the tonearm is down, pin 10 of microprocessor outputs H so the pin 10 of IC105 is H. This is applied to pin 3 of microprocessor, the CUE input pin, and the tonearm will be raised.



(7) Inhibits Repeat Inputs during CUT

During the CUT operation, the input of repeat signal is inhibited.

When the tonearm is up, the Up SW1 is on and the inverted L is applied to pin 9 of IC108. When the tonearm is moving outward way, the pin 12 of microprocessor becomes H. So, when the tonearm is up and moving outward (tonearm returning to rest), pin 10 of IC108 is L. Pin 18 of microprocessor is L when not playing the disc, thus the output from pin 4 of IC108 is H. Output of IC108 NAND becomes L and inhibits the repeat.

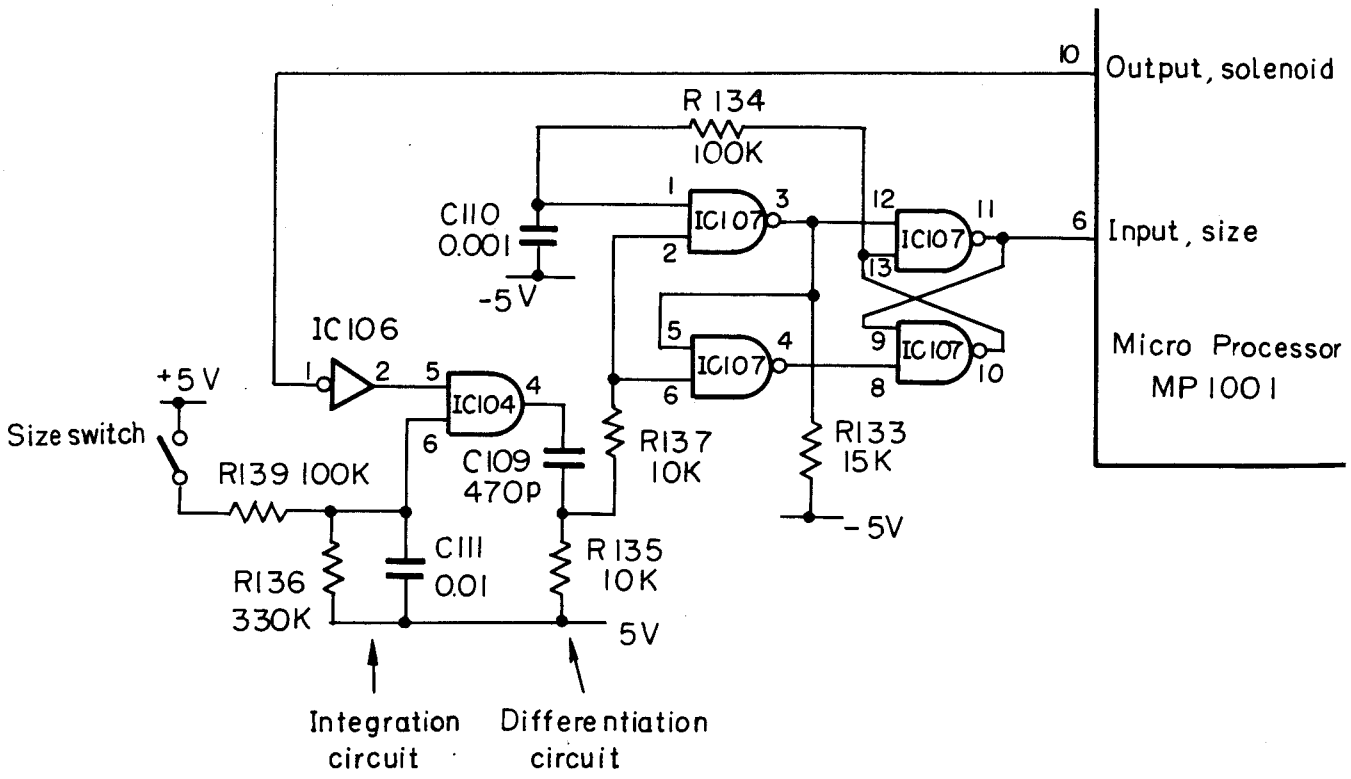


(8) Size Change

With the pressing of Size switch instructs microprocessor to change the lead-in position. Also interrupt size change signal when the tonearm is descended.

IC107 composes T-type flip-flop. The output level is reversed at each H input pulse. Each press of size switch reverses output level at pin 11 of IC107. (H for 12", L for 7"). R133 sets initial status at power ON (output will be H).

When the tonearm is down, the pin 10 of microprocessor is H. IC106 inverts this to L and applies to input of IC104, so even the H pulse comes from Size switch, the output of IC104 is kept low and size change signal is not applied to microprocessor.

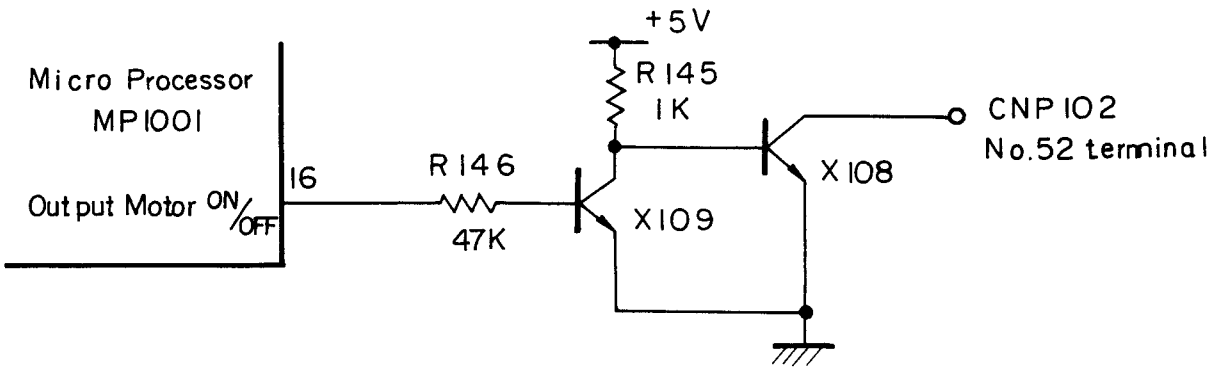


(9) Controller, Main Motor

To setup ON/OFF and rotary speed by means of output level of MP1001.

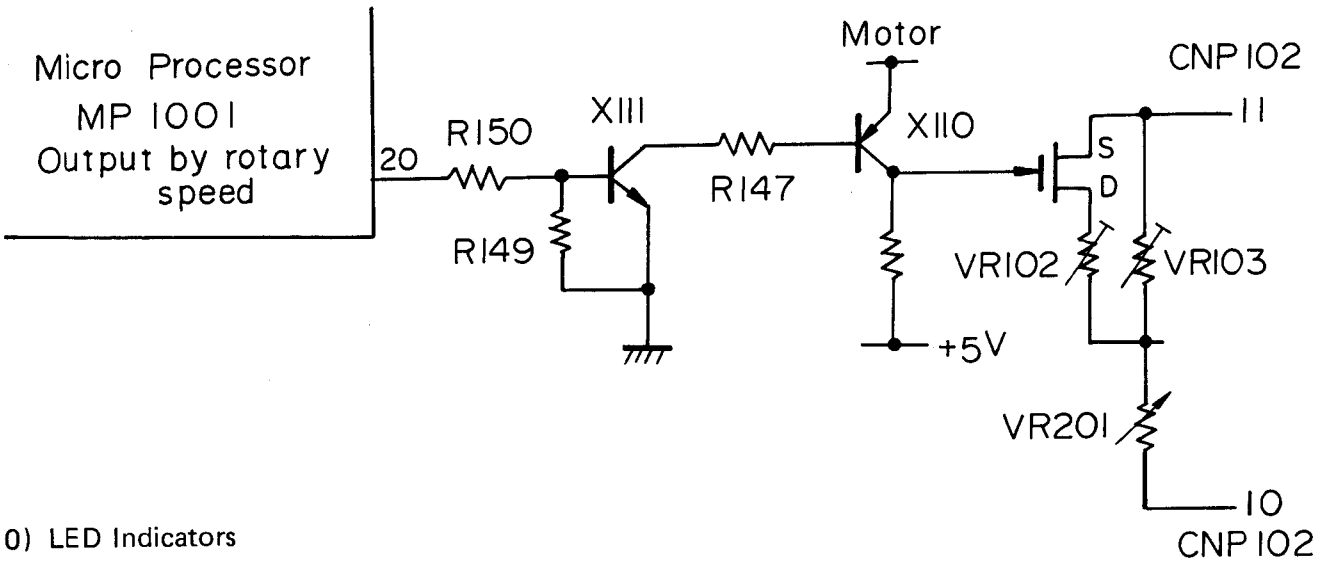
1. ON/OFF Control

Motor stops when the terminal 52 of CNP102 is grounded. Pin 16 of microprocessor is H when motor needs to be rotate. X109 turns on and X108 turns off. When pin 16 goes L, X109 turns off and X108 turns on, then the terminal 52 is grounded.



2. Speed Control

When the terminal 11 of CNP 102 is grounded, the revolution becomes 45 rpm. For 45 rpm, pin 20 of microprocessor becomes H, X111 turns on and terminal 11 is grounded.

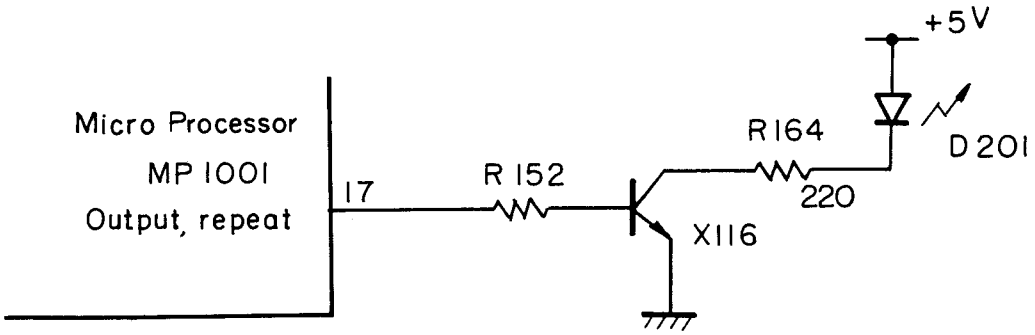


(10) LED Indicators

Switches LED indicators on and off.

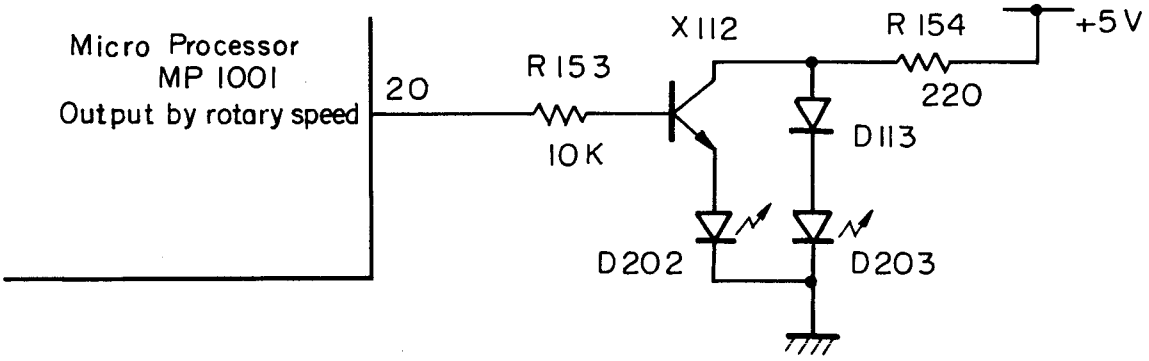
1. Repeat Indicator

Pin 17 of microprocessor becomes H when repeat is effective, and turns X116 on.



2. Speed Indicator

Pin 20 of microprocessor becomes H for 45 rpm (see paragraph 9). X112 turns on and D202 lights. For 33 rpm, Pin 20 is L and X112 if off, so D203 lights.



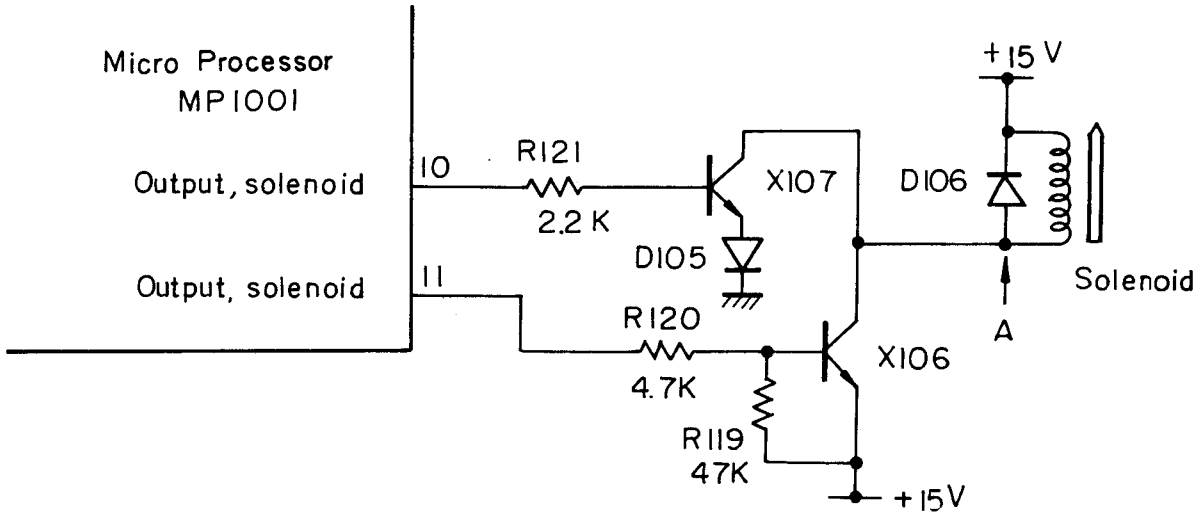
3. Size Indicator

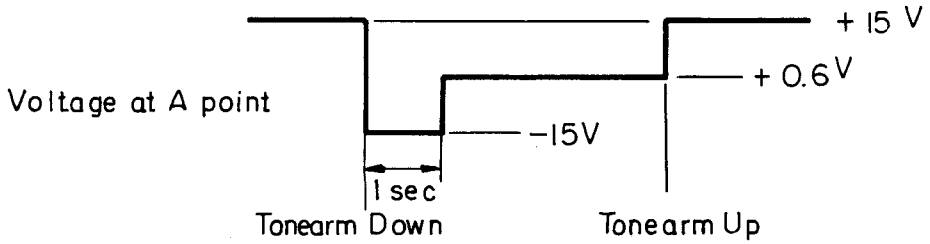
Per paragraph 8), H is applied to pin 6 of microprocessor. The same H signal is applied to X113 and turns D205 on. When L is applied for 7", X113 turns off and D204 lights.

(11) Solenoid Driving

Energizes solenoid to descend the tone arm.

When tonearm needs to be pulled down, both pins 10 and 11 of microprocessor becomes H. X106 turns on and 30V is applied to solenoid, pulling down the tonearm. (X107 is off in this state: collector voltage is lower than emitter voltage.)
In one second, pin 11 becomes low and X106 turns off, X107 turns on and 15V is applied to solenoid, keeping tonearm at down position.





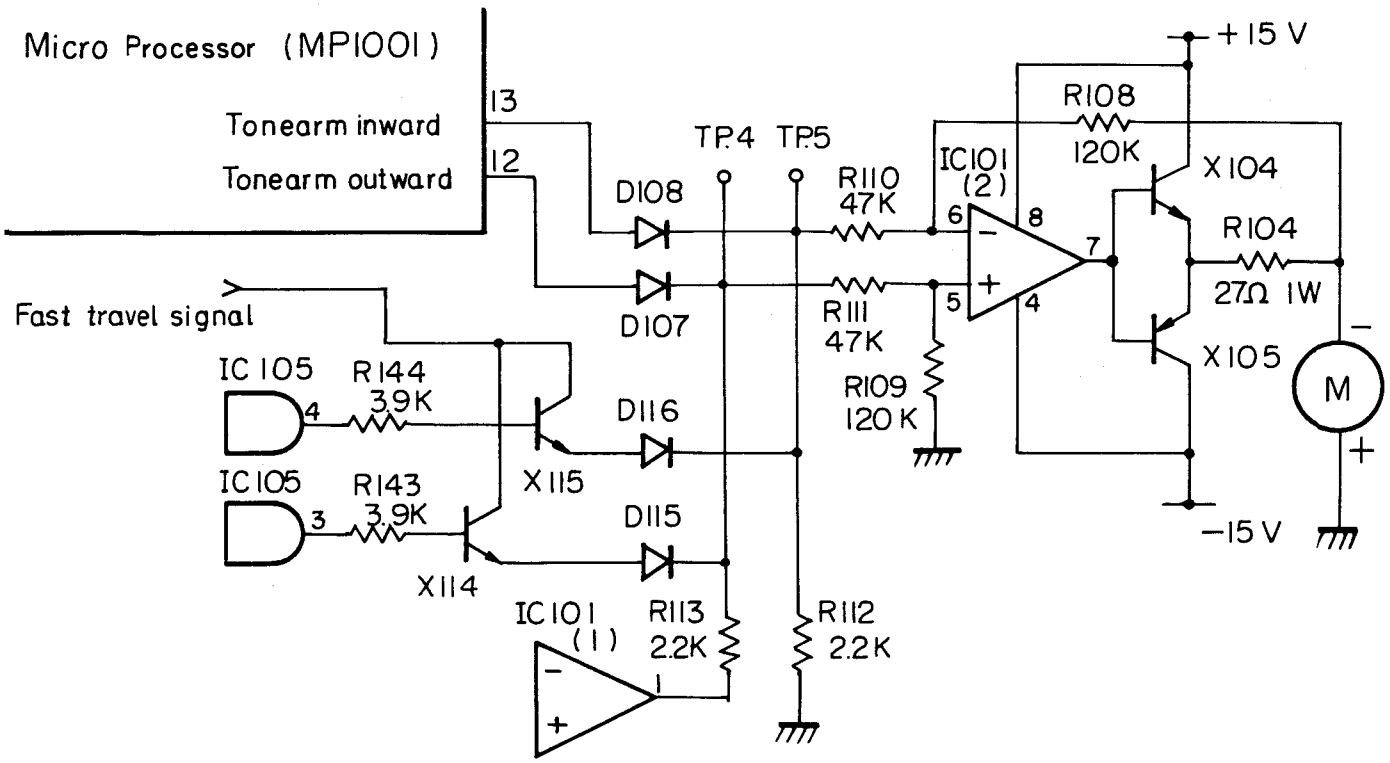
(12) Submotor Control

Controls direction and speed of submotor (tonearm driving motor) according to the signal from the microprocessor, manual switch or tracking error detection circuit (see paragraph 13).

When the voltage at TP4 is higher than at TP5, IC101(2) acts as non-inverting amplifier and motor rotates to move tonearm outward. When TP5 voltage is higher, IC101(2) acts as inverting amplifier and motor rotates in reverse way.

When the Pin 13 of microprocessor is H (+5V), voltage at TP5 becomes about 4.4V, and approximately −10V is applied to the motor. When the Pin 12 of microprocessor is H, +10V is applied.

When either of Manual switch is pressed, one of the IC105 output becomes H. If Fast travel signal is not applied (no collector voltage)X115 or X116 acts like diode, and as the result of voltage drop across the X115(X116), TP5(TP4) voltage becomes about 1.4V. The voltage to the motor is about −4V (+4V). When Fast travel signal is H, TP5(TP4) voltage becomes 4.4V (voltage drop of D116(D115) only) and tonearm will move faster due to higher voltage to the motor.



(13) Tracking Error Detection

Detects the slant of tonearm with photo-sensor and corrects the error. The pitch between each groove of disc is not uniform. Soft passage will have smaller groove while on the peak of music the groove will be larger/deeper. This circuit is to detect the pitch of groove and move tonearm so the stylus descends on the groove perpendicular. When tonearm is in up position, this circuit is deactivated.

When tonearm slants inward, light to the photo-sensor increase and voltage at point A becomes high: When slanted outward, light decrease and voltage becomes low. VR101 adjust the sensitivity of photo sensor: it should be adjusted so the tonearm slant to inward at maximum makes the voltage at point A almost saturated.

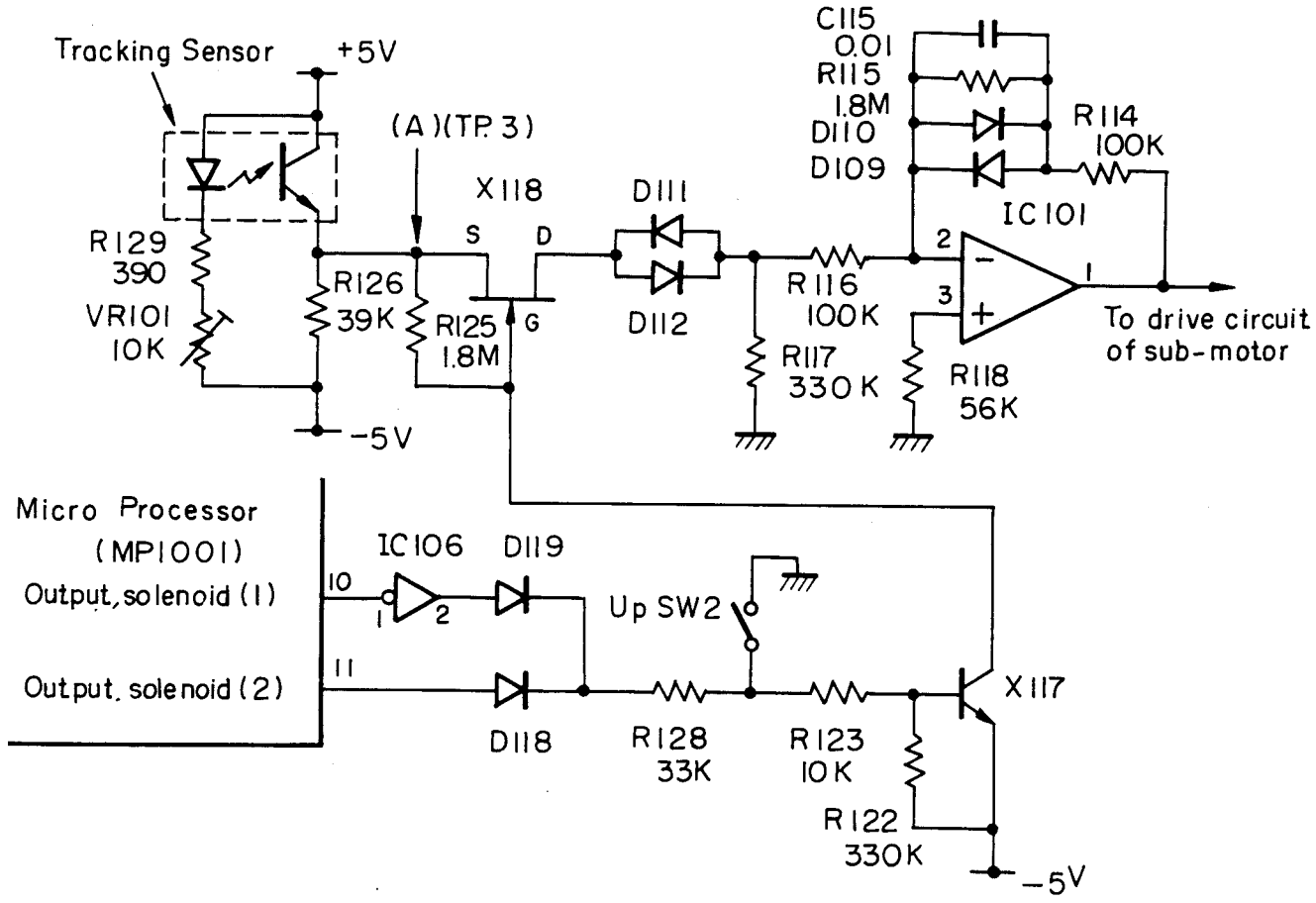
IC101 acts as inverter (the gain is OdB) and conveys error signal to submotor controlling circuit. D111/D112 is to weaken the sensitivity of sensor when the tonearm is in the center correct position. D110/D119 apply bias to IC101 output for about 0.6V.

When the voltage at point A increases, the output of IC101 decreases, TP4(see schematic on previous paragraphs) voltage goes low and tonearm moves inward to correct inward slant. Similarlly, when tonearm slants outside tonearm moves outward.

The tracking error calibration circuit is disabled when:

(1) Tonearm is in up position (pin 10 of microprocessor is L and IC106 output is H).
(2) Tonearm is descending to the disc (either Up SW2 is on or pin 11 of microprocessor emits H signal).

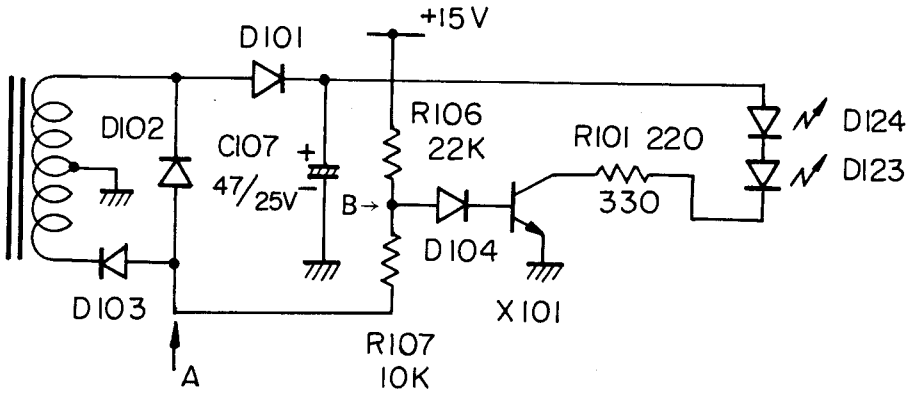
In each case, H is applied to base of X117, making it conducts. The gate of FET X118 goes low and error signal is not conveyed to the IC101.



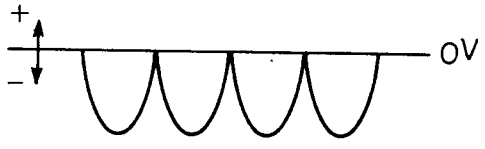
(14) Stroboscope Indicator

Makes LED flashes.

Waveforms at A point will be as follows:

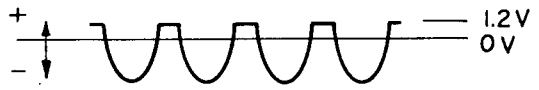


Wave form at point A.



R106 and R107 divide the voltage applied across these. And the voltage at point B will be:

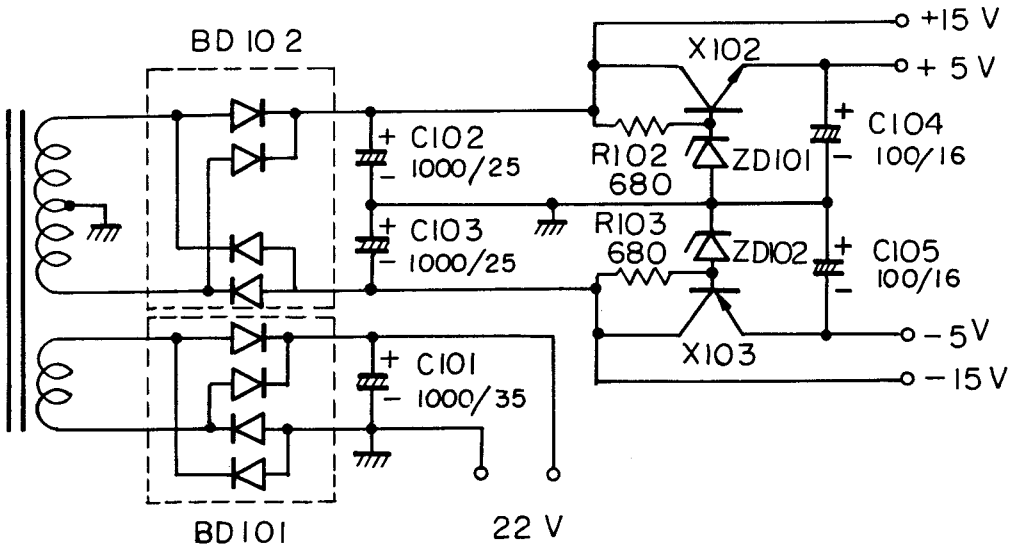
Wave form at point B.



When the voltage at B exceeds 1.2V, X101 turns on and lights LEDs. LEDs light up the stroboscope under the turntable platter, and reflected the stroboscope mirror.

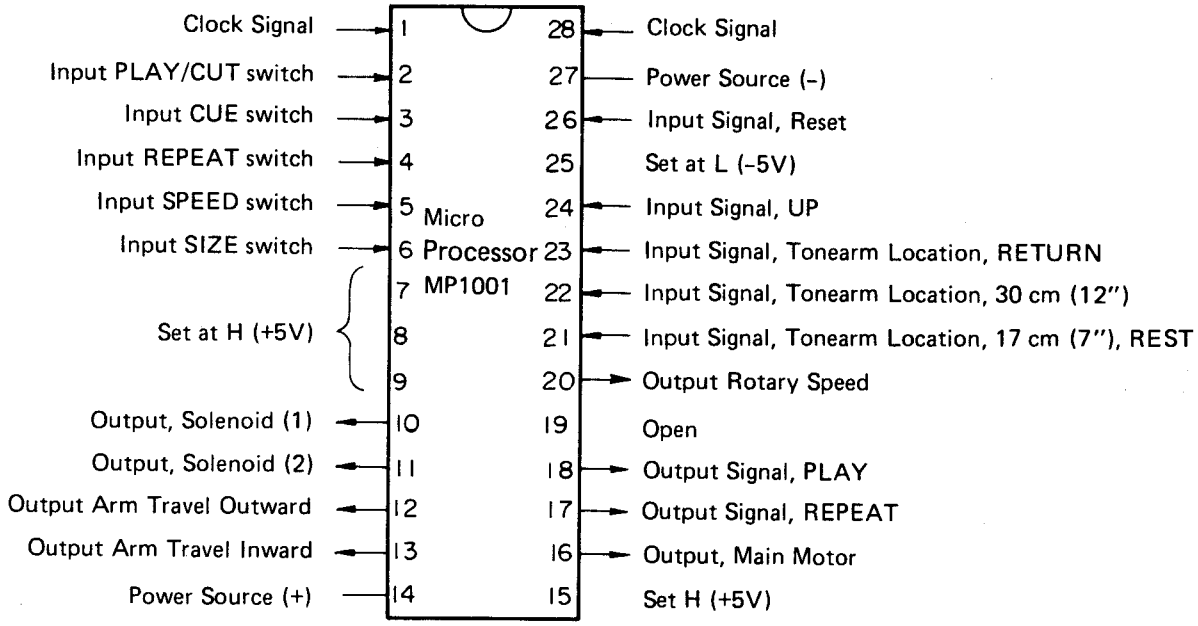
(15) Power Supply:

Generates three DC power source:
+/− 15V for IC101, submotor drive and solenoid drive
+/− 5V for logic circuit
22V for main motor drive



Micro Processor

1. Pin Location:



All of the terminals are open drain.

2. Function of Pins:

1) Clock:

Clock input signal of microprocessor and oscillation frequency is about 400 k Hz.

2) Input, PLAY/CUT switching:

Input level H (+5V) is accepted as PLAY signal at the rest position, also is accepted as CUT signal at position other than rest.

3) Input, CUE switching:

Input H (+5V) sign is accepted as UP, DOWN signal by pressing CUE button.
But signal is interrupted when tonearm is at the rest position or in motion.

4) Input, REPEAT switching:

Input H (+5V) is accepted as REPEAT ON, or REPEAT OFF signal by pressing repeat button.

5) Input, SPEED switching:

Input H (+5V) is accepted as speed change signal by pressing speed change button.

6) Input, SIZE switching:

Input H (+5V) is read as 30 cm (12") and H (-5V) is read as 17 cm (7"), but the signal is accepted only when the tonearm is traveling from the tonearm rest to lead-in point to start play.

7, 8, 9) No. 7, 8 and 9 are optional pins, not used and set at H (+5V).

10) Output (1), Solenoid:

To feed H (+5V) signal for tonearm down motion, and is opened for tonearm up motion.

11) Output (2), Solenoid:

To feed H (+5V) signal for only initial 1 sec., for the tonearm down motion, and it is opened in other mode.

12) Output, Arm Travel Outward:

To feed H (+5V) signal for outward travel of tonearm in automatic mode, and also to feed H (+5V) as BRAKE signal to interrupt inward travel of the tonearm and at tonearm down motion.

13) Output, Arm Travel Inward:

To feed H (+5V) signal for inward travel of tonearm in automatic mode, and also to feed H (+5V) as BRAKE signal to interrupt outward travel of the tonearm and at tonearm down motion.

14) Power Source (+):

±5V is used as 10V power source.

15) No. 15 is optional pin, not used and the level is set at H (+5V).

16) Output, Main Motor ON/OFF:

To feed H (+5V) signal when PLAY input is applied and the tonearm is located other than at the rest position.

17) Output Signal, REPEAT:

To feed H (+5V) signal for REPEAT ON, and it is opened for REPEAT OFF.

18) Output Signal, PLAY:

To feed H (+5V) signal when the tonearm leaves the rest position, but it is opened for CUT mode.

19) No. 19 is optional pin, not used and opened.

20) Output Rotary Speed:

To feed H (+5V) for 45 rpm, and it is opened at 33 rpm.
Initial level of the signal is opened for 33 rpm.

21, 22, 23) Input Signal, Tonearm Location:

Same function as 2-1).

24) Input Signal, UP:

To read completion of tonearm lift motion by H (+5V) input signal.

25) No. 25 is optional pin, not used and set at L (-5V).

26) Input Signal, Reset:

To recover output signal to initial level by H (+5V) input signal.

To reset all modes to initial mode by input signal of H (+5V).

Initial mode means that the tonearm is located at the rest position and speed is 33 rpm.

27) Power Source (-):

±5V is used as 10V power source.

28) Clock Signal:

Clock input signal of microprocessor and oscillation frequency is about 400 k Hz.

3. Rating:

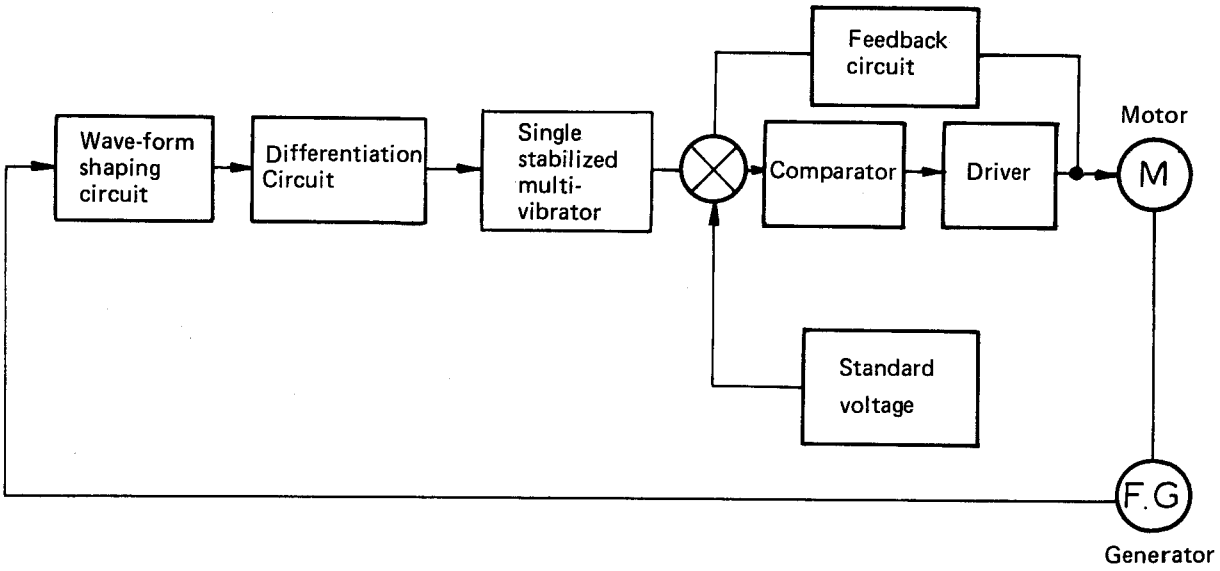
Power Source:	10V ± 10%
Input Terminal:	H -- 8V or more L -- 5.7V or less
Output Terminal:	Open drain, but provides additional PULL-DOWN resistors to the terminals.

PRINCIPLE OF OPERATION FOR MOTOR

1. Control System

   F.G. control system by AC generator

2. Block Diagram



Control frequency

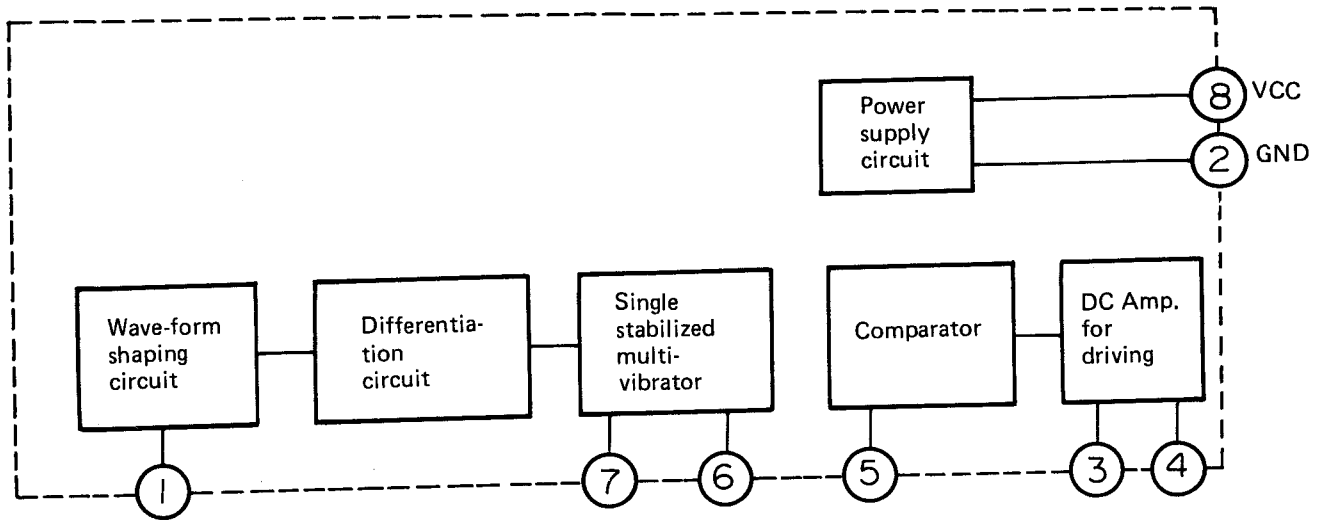
Ep:	1500r.p.m.	300HZ
Lp:	1110r.p.m.	220HZ

3. FG generator placed at the spindle of motor and spindle of motor generate sine wave of various frequency according to speed. The sine wave is converted to square wave by transistor amplifier of IC. The square wave is divided by differentiation circuit.
   Only pulse portion of the wave is used as trigger pulse of single stabilized multi-vibrator, and generates square wave of duty circle according to frequency.
   Difference between standard voltage of IC and that the square wave of single stabilized multi-vibrator is smoothed, works signal of driving.
   Rotary speed adjustment is done by changing time constant of single stabilized multi-vibrator.

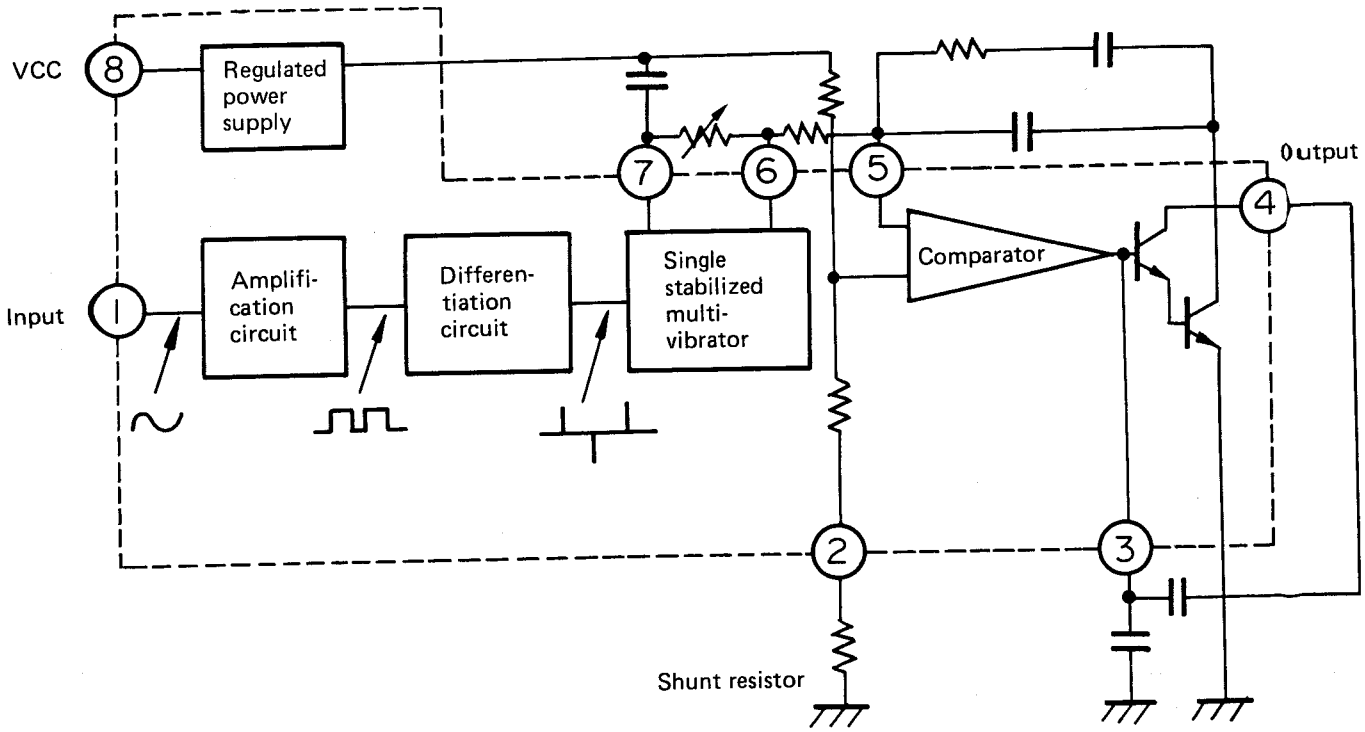
4. Generator: 12 pulse/one revolution

5. IC1 (μPC1003C2)

BLOCK DIAGRAM(A)



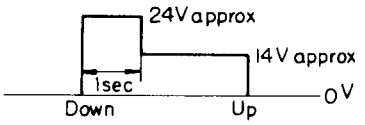
BLOCK DIAGRAM(B)



TROUBLE SHOOTING GUIDE

Symptom	Cause	Procedure
LEDs D123, D124 for strobe do not turn ON.	1. Power Transformer is defective.	1. Check the voltage between terminals 3 and 5 of CNP 101. If 23V AC is not observed, replace transformer.
	2. Fuses has blown.	2. Check fuses 102 and 103. above. Replace fuse(s).
	3. Diode D101 is defective.	3. Check the voltage between terminals TP7 and 6 or CNP 108. If DC voltage is not observed, replace diode.
	4. LEDs D123, D124 are defective, or Transistor X101 is defective.	4. Check the voltage between both terminals of both LEDs. If pulse voltage is observed, replace LEDs, if it is not observed, replace transistor X 101.
Play/Cut		
a) Tonearm does not move.	a) 1. Position Sensor Ass'y is defective.	a) 1. Check voltage between the following points. TP7 and 42 of CNP105: should be 5V TP7 and 43 of CNP105: should be -4V TP7 and 44 of CNP105: should be -4V TP7 and 45 of CNP105: should be 3.8V If any of the voltages are not observed, replace Position Sensor Ass'y.
	2. Sub Motor is defective.	2. Check voltage between terminals 39 and 40 of CNP107. If 10V DC is observed, replace Sub Motor.
	3. Transistor X104, X105 are defective.	3. Check voltage between Base and Emitter of Transistors X104 and X105. If 0.6V DC is not observed, replace Transistor(s).
	4. IC 101 is defective.	4. Check voltage between terminals TP7 and 13 of IC102. If 5V DC is observed, replace IC 101.

Symptom	Cause	Procedure
Play/Cut (continued) a) Tonearm does not move.	5. Play/Cut Switch is defective.	5. Check voltage between terminals TP7 and 2 of IC 102 with pushing Play/Cut Switch. If 5V DC is observed, replace IC 102. If other than 5V DC, replace Switch.
	6. Movement of Linear Tracking Carrier Mechanism is stiff.	6. While pushing Pulley Holding Plate Ass'y to release tension of Wire Belt, check Carrier Mechanism for smoothness of movement. Check routing for lead wire interferance with Carrier Mechanism Movement. Check Guide Bar. Replace if deformed, dented, nicked.
b) Tonearm returns to rest position during lead-in motion.	b) 1. Position Sensor Ass'y is defective.	b) 1. Check as specified in item a) 1.
	2. Improper adjustment of Tracking Sensor.	2. Place Tonearm on its rest, and check voltage between terminals TP7 and TP3. Voltage should be 0 ± 0.6V, if not, Adjust position of Tracking Sensor Ass'y.
	3. Movement of Linear Tracking Carrier Mechanism is stiff.	3. Check as specified in item a) 6.
c) Tonearm does not descend to Disc.	c) 1. Leaf Switch (UP SW1) is defective.	c) 1. Contacts of Leaf Switch (UP SW1) should be closed when Power Switch (SW201) is OFF and Tonearm is UP. Check voltage between terminals TP7 and 35 of CNP 106; voltage should be 5V; if -5V is observed, contacts of Leaf Switch are not closed.
	2. Solenoid is defective.	2. Press Play/Cut Switch (SW202) ON while monitoring voltage between 32 and 33 of CNP106.

Symptom	Cause	Procedure
Play/Cut (continued) c) Tonearm does not descend to Disc. (continued)		As Tonearm descends, voltage should change from 24V, after 1 sec, to 14V (approx) and voltage should remain at 14V during Disc play (cue down). When Tonearm is at rest position (Cue UP), voltage should be 0V. 
	3. Improper Solenoid stroke adjustment.	3. Adjust stroke of Solenoid.
	4. Improper adjustment of clearance between Elevation Lever and Elevation Spindle.	4. Re-install Elevation Lever so the proper clearance between Elevation Lever and Elevation Spindle is obtained.
Repeat Repeat LED does not turn ON.	1. LED (D201) is defective.	1. Check voltage between terminals 23 and 27 of CNP 104; if voltage changes by pushing Repeat Switch, replace LED.
	2. Transistor X116 or IC 102 is defective.	2. Check voltage between terminals TP7 and 17 of IC 102. If 5V DC 9s observed, replace X116. If other than 5V DC, replace IC 102.

Symptom	Cause	Procedure
Horizontal Horizontal movement is intermittent or non-existent.	1. Sub motor is defective.	1. Check voltage between terminals 39 and 40 of CNP 107 while pushing Manual Search Switch. Voltage readings will be determined by speed of Tonearm movement selected and direction (in relation to Main Motor shaft). Fast inward: More than -10V Slow inward: More than -3V Fast outward: More than +10V Slow outward: More than +3V. If Sub motor does not rotate in spite of even when above voltages are ob served, replace Sub motor.
	2. Adjustment of Tracking Sensor Ass'y is not in good condition.	2. Check as specified in item b) 2 of Play/Cut.
	3. Transistors X104, X105 are defective.	3. Check as specified in item a) 3 of Play/Cut.
	4. IC 101 is defective.	4. Check voltage between terminals TP7 and TP4 or TP5 while pushing Manual Search Switch. Fast inward: TP7 – TP5: 4.4V Slow inward: TP7 – TP5: 1.4V Fast outward: TP7 – TP Slow outward: TP7 – TP4: 1.4V If above voltage are observed, replace IC 101.
	5. Manual Search Switch or IC 105 is defective.	5. Check voltage between terminals TP7 and 24, 25 or 26 of CNP 104 while pushing Manual Search Switch. Fast inward: TP7 – 24, 25: 5V Slow inward: TP7 – 25: 5V Fast outward: TP7 – 24, 26: 5V Slow outward: TP7 – 26: 5V If above voltage are observed, replace IC 105. If above voltages are not observed while pushing Manual Search Switch, replace Switch.

Symptom	Cause	Procedure
Size		
a) Record Size Selector is does not function.	a) 1. Tonearm is in Down position. 2. IC 107 or Size Selector Switch is defective.	a) 1. Make sure that Tonearm is in UP position. 2. Check voltage between terminals TP7 and 19 of CNP 103. If 5V DC is observed while pushing Size Selector Switch, replace IC 107. If 5V DC is not observed, replace Size Selector Switch.
b) Size Select Indicator(s) (LED) do not turn ON.	b) LED(s) (D204 for 17 cm, D205 for 30 cm) is defective.	b) Check voltage between terminals TP7 and 6 of IC 101. If voltage changes -5V, +5V alternately when Size changes (LED does not change), replace LED(s). If voltage does not change, check as specified above.
Speed		
a) Speed Selector does not function or Speed Select Indicator(s) (LED) does not turn ON.	a) 1. IC 102, Speed Selector Switch (SW205), Transistor X111, LED(s) (D202 for 45 rpm, D203 for 33 rpm) or Motor is defective.	a) 1. Check voltage between terminals TP7 and 20 of IC 102. If voltage changes 5V, 0V alternately when speed changes, replace LED(s); if it changes and Indicator (LED) changes but motor speed does not change, replace transistor X111. If voltage does not change, replace IC 102 or Speed Selector Switch. Connect TP7 and 7 of CNP 102; if motor speed changes to 45 rpm, replace Transistor X111; if it does not change, replace Motor.
	2. IC 102, Speed Selector Switch is defective.	2. Check voltage between terminals TP7 and 18 of CNP 103. If 5V DC is observed while pushing Switch, replace IC 102; if other than 5V, replace Switch.
b) Speed Select indicator (LED) does not light.	b) LED(s) is defective.	b) Check and replace.

Symptom	Cause	Procedure
Other defects 1. LED is dimly lit. 2. Strobe is dimly lit when ON. 3. Horizontal movement control button is jamming.	1. LED lights dimly. 2. Fuse 102 has blown. 3. Button touches edge of opening in Plastic Base. ◀◀ or ▶▶	1. Straighten by hand. 2. Replace. 3. Adjust installation of button and check clearance between the opening and both sides of button (should be 1mm).
Other defects (continued) 4. No output from Cartridge only. L and R channel reversed. 5. Strange sound when Cartridge descends. 6. Strange sound from Main Motor. 7. Stylus cannot touch Disc with Cue down. 8. Stylus bounces on Disc after Tonearm descends. 9. Tonearm base moves left or right after Tonearm descends. descends. 10. No Auto return. 11. Stylus scratches Disc surface with cue up or during return to Tonearm Rest.	4. Cartridge is defective. Improper connection of Lead Wires. 5. Amount of silicon oil on Solenoid shaft is not enough. 6. Foreign matter stuck on Motor magnet. 7. Stylus height is set too hight. 8. Improper vertical movement of Elevation Plate (Ref. No. 33). 9. Improper adjustment of Tracking Sensor. 10. Movement of Linear Tracking Carrier is stiff. 11. Slackness in Elevation Plate.	4. Replace the Cartridge Ass'y. 5. Put silicon oil on Solenoid shaft. 6. Remove. 7. Adjust Stylus height as described in Adjustment of Stylus height. 8. Replace Elevation Plate. 9. Check Tracking Sensor as described in item b) 2. of Play/Cut. 10. Check movement of Carrier Mechanism as described in item a) 6. of Play/Cut. 11. Replace Elevation Plate.
Motor: Troubles about Control Circuit Board Ass'y: 1. Trouble about Speed: 2. Unstableness: 3. Trouble about voltage characteristics:		1. Check single stabilized malti-circuit. 2. Check feed-back circuit. 3. Check R1 and to be 68 ohm.

SCHEMATIC DIAGRAM

IC101
NJM4558D

IC102
MP1001

IC103
μPD4071BC

IC104, IC105
MC14081B

IC106
TC4069UBP

IC107
CD4011BE

IC108
LC4001B

X101, X108, X109,
X111~X117
2SC945 (P), (Q)

X102
2SD882 (P), (Q)

X103
2SD772 (E), (P), (Q)

X104
2SD667 (C), (D)

X105
2SB647 (C), (D)

X106, X107
2SD667 (D)

X110
2SA733 (P), (Q)

X118
2SK68 (K), (L)

X119
2SK336

BD101
S1VB10

BD102
RB-151

D101~D104,
D107~D119, D121
1SS53

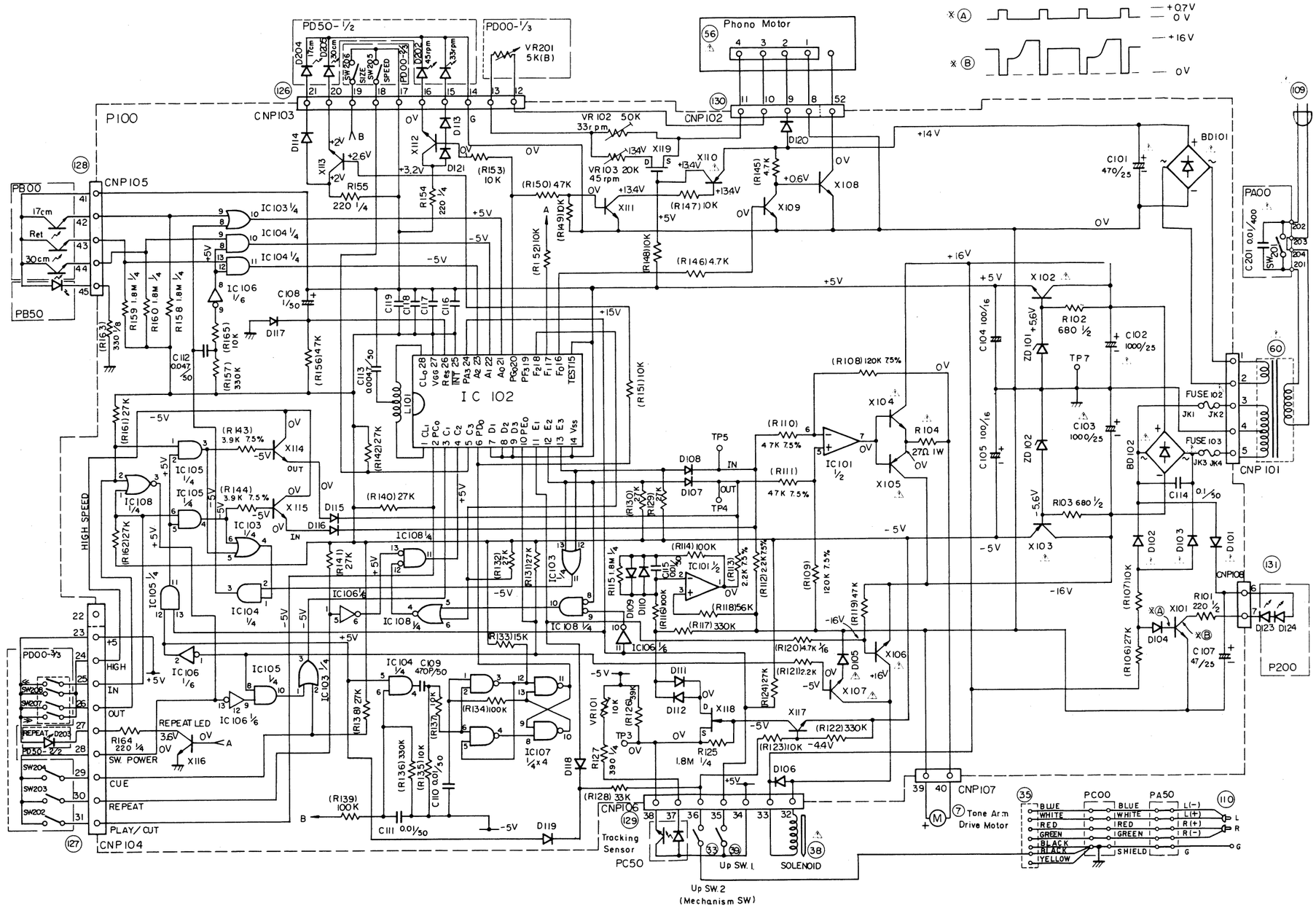
D105, D106, D120
F14C

ZD101, ZD102
HZ6LA-3

D123, D124
AA-5534S

D201, D205
GL-9PR2

D202~D204
GL-9NG2



Voltage of IC

PIN NO.	IC101	IC102	IC103	IC104
1	0	*400kHz	−5	−5
2	0	−5	−5	−5
3	0	−5	−5	−5
4	−16	−5	−5	−5
5	0	−5	−5	+5
6	0	+5	−5	−5
7	0±1	+5	−5	−5
8	+16	+5	−5	+8
9		+5	+3~+5	−5~−3
10		−5	+5	−5
11		−16	−5	−5
12		−5	−5	+5
13		−5	−5	−5~−3
14		+5	+5	+5
15		+5		
16		0		
17		0		
18		−5		
19		−5		
20		0		
21		+5		
22		−5		
23		−5		
24		+5		
25		−5		
26		−0.6		
27		−5		
28		*400kHz		

PIN NO.	IC105	IC106	IC107	IC108
1	−5	−5	−5	−5
2	+5	+5	−5	−5
3	−5	−	+5	+5
4	−5	−	+5	−5
5	+5	−5	+5	+5
6	−5	+5	−5	−5
7	−5	−5	−5	−5
8	−5	+5	+5	−5
9	−5	−5	+5	−5
10	−5	−5	−5	+5
11	+5	+5	+5	−5
12	+5	−5	+5	−5
13	+5	+5	−5	+5
14	+5	+5	+5	+5

UNIT: VOLTAGE

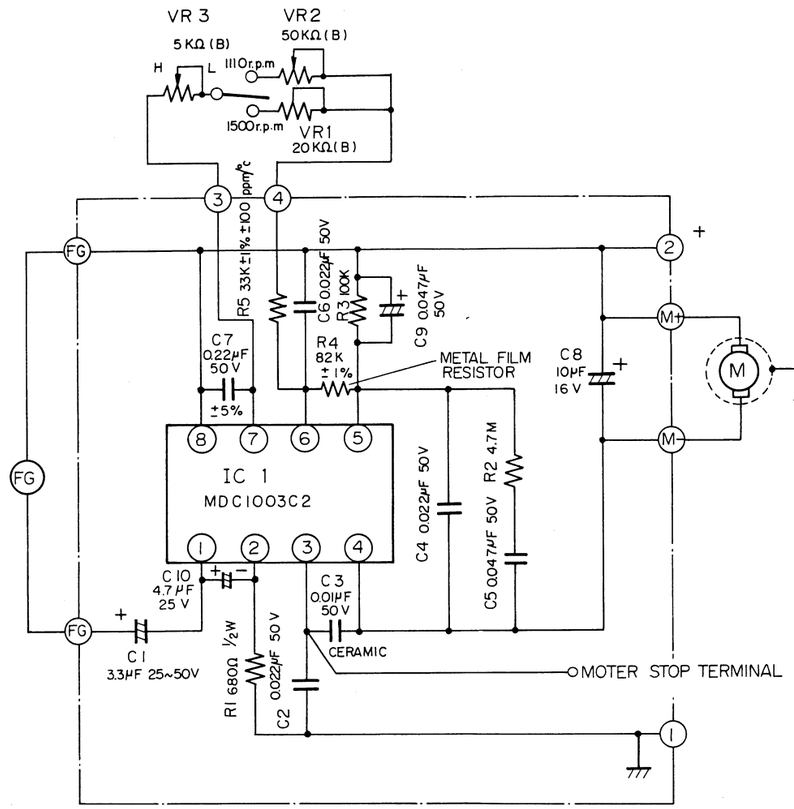
*Mark: To check frequency.

Note on safety:

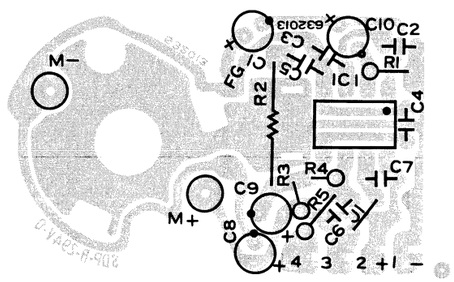
Symbil ⚠ fire or electrical shock hazard.
Only original parts should be used to replace any parts marked with symbol ⚠.
Any other component substitution (other than original type), may increase risk of fire or electrical shock hazard.

Components and wiring are subject to change for modification without notice.

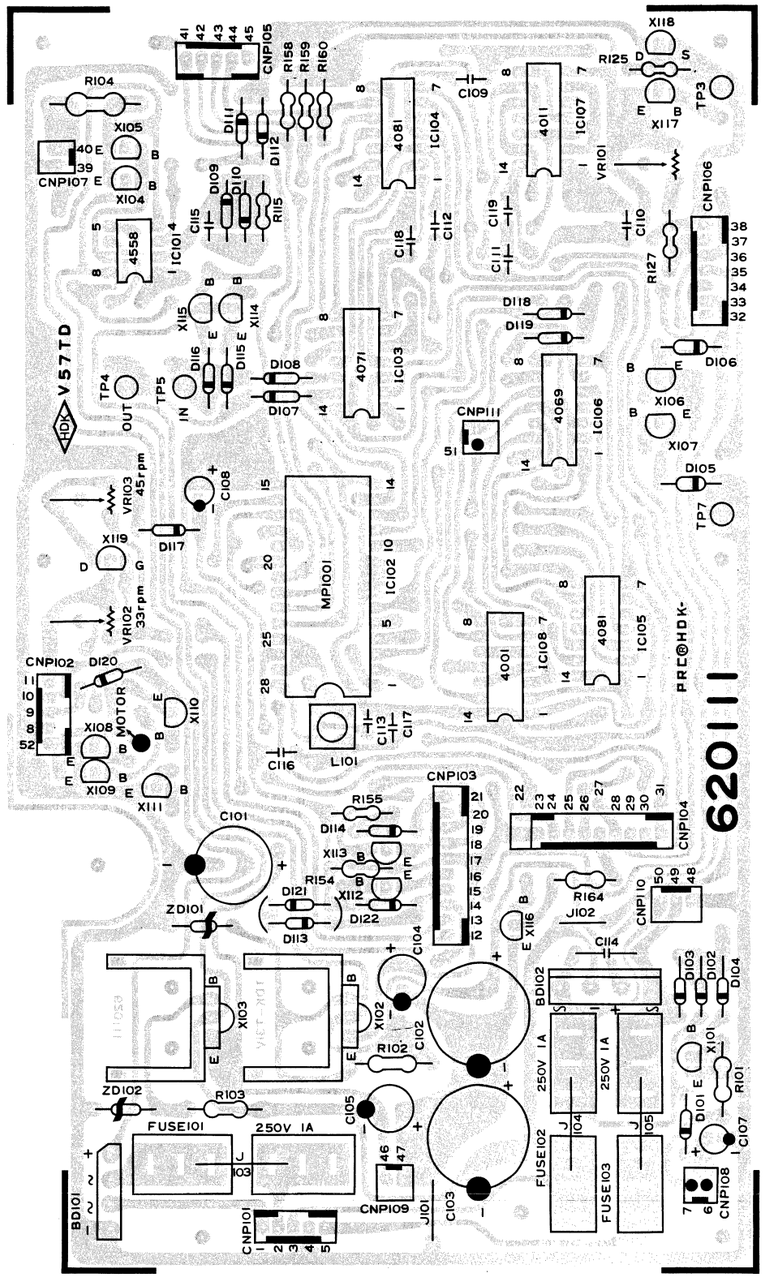
MOTOR CONTROL CIRCUIT DIAGRAM



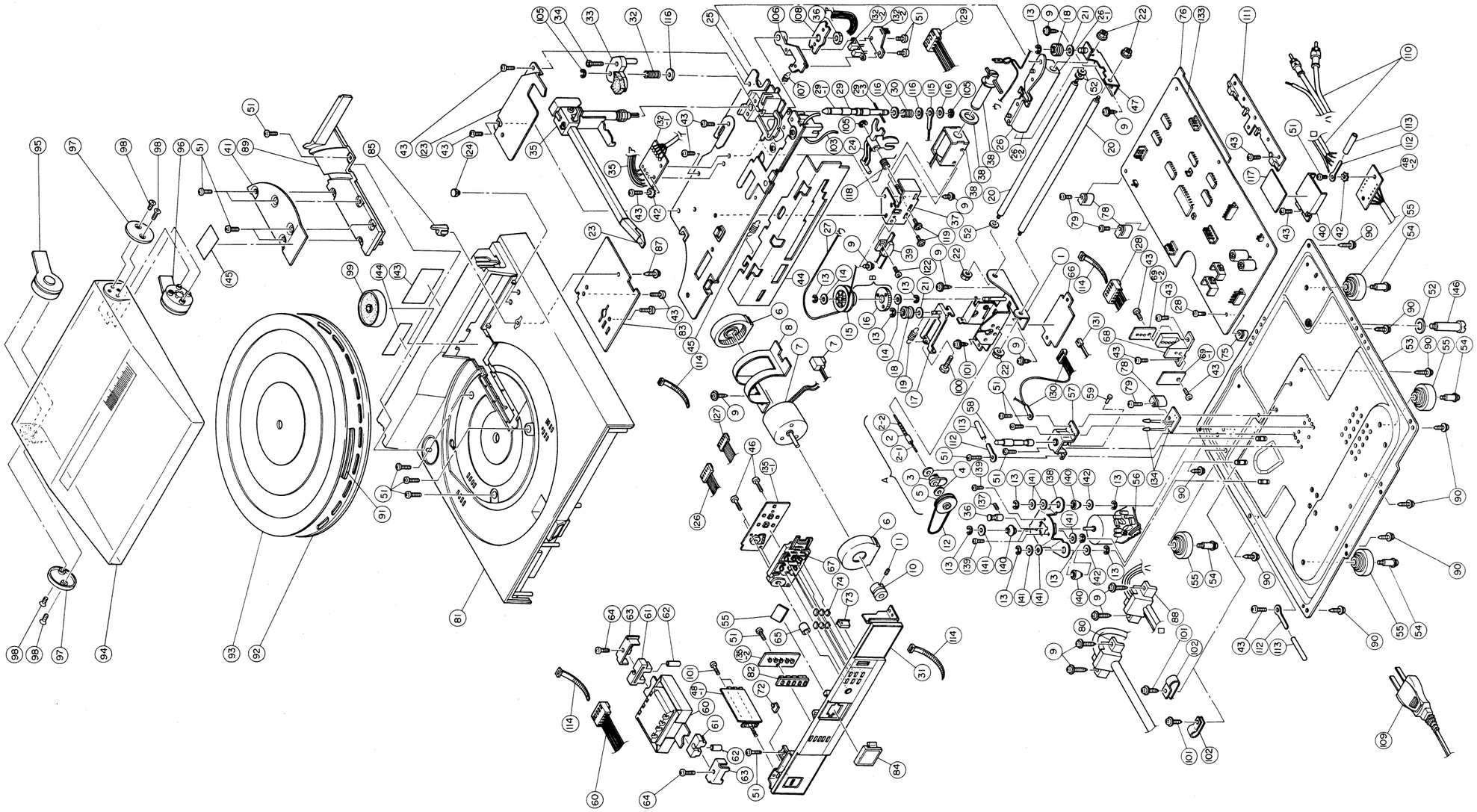
MOTOR COMPONENT LOCATIONS



CONTROL COMPONENT LOCATIONS



EXPLODED VIEW



REF. DESIG.	PART NO.	QUANTITY E	N	T	A	DESCRIPTION
						P100-CONTROL CIRCUIT BOARD
P100	620.1110.nec	1	1	1	1	P.W. Board, Control
133	632.1730.nec	1	1	1	1	P.W. Board Assembly
133	632.173-1.nec	1	1	1	1	P.W. Board Assembly
						P100-CAPACITORS
C101 ⚠	Z40.8021.2ne	1	1	1	1	Elect 470μF 25V
C102 ⚠	Z40.8031.5ne	1	1	1	1	Elect 1000μF 25V
C103 ⚠	Z40.8031.5ne	1	1	1	1	Elect 1000μF 25V
C104	Z40.8020.7ne	1	1	1	1	Elect 100μF 16V
C105	Z40.8020.7ne	1	1	1	1	Elect 100μF 16V
C107	Z40.8030.7ne	1	1	1	1	Elect 47μF 25V
C108	Z40.8050.5ne	1	1	1	1	Elect 1μF 50V
C109	Z40.8382.5ne	1	1	1	1	Ceramic 0.01μF
C110	Z40.8382.5ne	1	1	1	1	Ceramic 0.01μF
C111	Z40.8382.5ne	1	1	1	1	Ceramic 0.01μF
C112	Z40.8383.3ne	1	1	1	1	Ceramic 0.047μF
C113	Z40.8210.9ne	1	1	1	1	Film 0.0047μF ±10%
C114	Z40.8383.7ne	1	1	1	1	Ceramic 0.1μF
C115	Z40.8382.5ne	1	1	1	1	Ceramic 0.01μF
C116	Z40.8382.5ne	1	1	1	1	Ceramic 0.01μF
C117	Z40.8382.5ne	1	1	1	1	Ceramic 0.01μF
C118	Z40.8382.5ne	1	1	1	1	Ceramic 0.01μF
C119	Z40.8382.5ne	1	1	1	1	Ceramic 0.01μF
						P100-RESISTORS
						(All Resistors are ±5% & 1/4W)
R101	Z40.5806.4ne	1	1	1	1	220Ω 1/2W
R102	Z40.5800.5ne	1	1	1	1	680Ω 1/2W
R103	Z40.5800.5ne	1	1	1	1	680Ω 1/2W
R104 ⚠	Z40.5401.8ne	1	1	1	1	27Ω 1W
R115	Z40.5055.1ne	1	1	1	1	1.8MΩ
R125	Z40.5055.1ne	1	1	1	1	1.8MΩ
R127	Z40.5046.3ne	1	1	1	1	390Ω
R154	Z40.5045.7ne	1	1	1	1	220Ω
R155	Z40.5045.7ne	1	1	1	1	220Ω
R158	Z40.5055.1ne	1	1	1	1	1.8MΩ
R159	Z40.5055.1ne	1	1	1	1	1.8MΩ
R160	Z40.5055.1ne	1	1	1	1	1.8MΩ
R164	Z40.5045.7ne	1	1	1	1	220Ω

REF. DESIG.	PARTS NO.	QUANTITY E	N	T	A	DESCRIPTION
VR101	704.825-8.nec	1	1	1	1	10kΩ Trimming
VR102	704.825-1.1ne	1	1	1	1	50kΩ Trimming, 33 rpm
VR103	704.825-9.nec	1	1	1	1	20kΩ Trimming, 45 rpm
						P100-SEMICONDUCTORS
IC101	Z41.2003.03n	1	1	1	1	I.C, NJM4558D
IC102	632.0000.nec	1	1	1	1	I.C, MP1001
IC103	Z41.2006.31n	1	1	1	1	I.C, μPD4071BC
IC104	Z41.2006.51n	1	1	1	1	I.C, MC14081B
IC105	Z41.2006.51n	1	1	1	1	I.C, MC14081B
IC106	Z41.2006.9ne	1	1	1	1	I.C, TC4069UBP
IC107	Z41.2006.7ne	1	1	1	1	I.C, CD4011BE
IC108	Z41.2005.9ne	1	1	1	1	I.C, LC4001B
X101	Z41.0410.2ne	1	1	1	1	Transistor 2SC945 (P), (Q)
X102 ⚠	Z41.0613.3ne	1	1	1	1	Transistor 2SD882 (P), (Q)
X103 ⚠	Z41.0207.2ne	1	1	1	1	Transistor 2SB772 (E), (P), (Q)
X104 ⚠	Z41.0607.3ne	1	1	1	1	Transistor 2SD667 (C), (D)
X105 ⚠	Z41.0204.3ne	1	1	1	1	Transistor 2SB647 (C), (D)
X106 ⚠	Z41.0607.3ne	1	1	1	1	Transistor 2SD667 (D)
X107 ⚠	Z41.0607.3ne	1	1	1	1	Transistor 2SD667 (D)
X108	Z41.0410.2ne	1	1	1	1	Transistor 2SC945 (P), (Q)
X109	Z41.0410.2ne	1	1	1	1	Transistor 2SC945 (P), (Q)
X110 ⚠	Z41.0010.2ne	1	1	1	1	Transistor 2SA733 (P), (Q)
X111	Z41.0410.2ne	1	1	1	1	Transistor 2SC945 (P), (Q)
X112	Z41.0410.2ne	1	1	1	1	Transistor 2SC945 (P), (Q)
X113	Z41.0410.2ne	1	1	1	1	Transistor 2SC945 (P), (Q)
X114	Z41.0410.2ne	1	1	1	1	Transistor 2SC945 (P), (Q)
X115	Z41.0410.2ne	1	1	1	1	Transistor 2SC945 (P), (Q)
X116	Z41.0410.2ne	1	1	1	1	Transistor 2SC945 (P), (Q)
X117	Z41.0410.2ne	1	1	1	1	Transistor 2SC945 (P), (Q)
X118	Z41.0801.2ne	1	1	1	1	F.E.T. 2SK68 (K), (L)
X119	Z41.0804.3ne	1	1	1	1	F.E.T. 2SK336
BD101⚠	Z41.1004.1ne	1	1	1	1	Diode, S1VB10
BD102⚠	Z41.1003.1ne	1	1	1	1	Diode, RB-151
D101 ⚠	Z41.1010.1ne	1	1	1	1	Diode, 1SS53
D102 ⚠	Z41.1010.1ne	1	1	1	1	Diode, 1SS53
D103 ⚠	Z41.1010.1ne	1	1	1	1	Diode, 1SS53
D104	Z41.1010.1ne	1	1	1	1	Diode, 1SS53
D105 ⚠	Z4..1001.3ne	1	1	1	1	Diode, F14C

REF. DESIG.	PART NO.	QUANTITY E	N	T	A	DESCRIPTION
D106	Z41.1001.3ne	1	1	1	1	Diode, F14C
D107	Z41.1010.1ne	1	1	1	1	Diode, 1SS53
D108	Z41.1010.1ne	1	1	1	1	Diode, 1SS53
D109	Z41.1010.1ne	1	1	1	1	Diode, 1SS53
D110	Z41.1010.1ne	1	1	1	1	Diode, 1SS53
D111	Z41.1010.1ne	1	1	1	1	Diode, 1SS53
D112	Z41.1010.1ne	1	1	1	1	Diode, 1SS53
D113	Z41.1010.1ne	1	1	1	1	Diode, 1SS53
D114	Z41.1010.1ne	1	1	1	1	Diode, 1SS53
D115	Z41.1010.1ne	1	1	1	1	Diode, 1SS53
D116	Z41.1010.1ne	1	1	1	1	Diode, 1SS53
D117	Z41.1010.1ne	1	1	1	1	Diode, 1SS53
D118	Z41.1010.1ne	1	1	1	1	Diode, 1SS53
D119	Z41.1010.1ne	1	1	1	1	Diode, 1SS53
D120	Z41.1010.1ne	1	1	1	1	Diode, 1SS53
D121	Z41.1001.3ne	1	1	1	1	Diode, F14C
ZD101	Z41.1260.1ne	1	1	1	1	Zener, HZ6A-3
ZD102	Z41.1260.1ne	1	1	1	1	Zener, HZ6LA-3
						P100-MISCELLANEOUS
CNP101	896.351-5.nec	1	1	1	1	Plug, (5P)
CNP102	706.033-4.nec	1	1	1	1	Plug, (4P)
CNP102	706.033-5.nec	1	1	1	1	Plug, (5P)
CNP103	706.033-1.nec	1	1	1	1	Plug, (10P)
CNP104	706.033-9.nec	1	1	1	1	Plug, (9P)
CNP105	706.033-5.nec	1	1	1	1	Plug. (5P)
CNP106	706.033-7.nec	1	1	1	1	Plug, (7P)
CNP107	896.351-2.nec	1	1	1	1	Plug, (2P)
CNP108	706.033-2.nec	1	1	1	1	Plug, (2P)
FUSE102 ⚠	Z42.0001.nec	1	1	1	1	Fuse, 1A 250V
FUSE103 ⚠	Z42.0001.nec	1	1	1	1	Fuse, 1A 250V
L101	706.2950.nec	1	1	1	1	OSC Transf.
JK1	893.395-1.nec	1	1	1	1	Jack, Fuse Holder
JK2	893.395-1.nec	1	1	1	1	Jack, Fuse Holder
JK3	893.395-1.nec	1	1	1	1	Jack, Fuse Holder
JK4	893.395-1.nec	1	1	1	1	Jack, Fuse Holder
501	911.6310.nec	1	1	1	1	Heat Sink
502	Y10.3008.03n	1	1	1	1	P. Tapt Screw, P3x8

REF. DESIG.	PART NO.	QUANTITY E	N	T	A	DESCRIPTION
						PA00-POWER SWITCH CIRCUIT BOARD
PA00 ⚠	911.593-A.nec	1	1	1	1	P.W. Board, Power Switch
48-1 ⚠	873.501-A.nec	1	1	1	1	P.W. Board Assembly
C201 ⚠	Z40.8600.5ne	1	1	1	1	Ceramic 0.01μF 400V
SW201⚠	910.673-1.nec	1	1	1	1	Push Switch, Power
109 ⚠	890.208-2.nec	1	1	1	1	A.C. Power Cord
						PA50-PHONO OUTPUT-1 CIRCUIT BOARD
PA50	911.593-B.nec	1	1	1	1	P.W. Board, Phono Output-1
48-2	873.501-B.nec	1	1	1	1	P.W. Board Assembly
110	870.7710.nec	1	1	1	1	Connective Cord, Output
						PB50-SENSOR-2 CIRCUIT BOARD
PB50	911.605-B.nec	1	1	1	1	P.W. Board, Sensor-2
69-1	911.658-B.nec	1	1	1	1	P.W. Board Assembly
						PB00-SENSOR-1 CIRCUIT BOARD
PB00	911.605-A.nec	1	1	1	1	P.W. Board, Sensor-1
69-2	911.658-A.nec	1	1	1	1	P.W. Board Assembly
128	911.6310.nec	1	1	1	1	Connective Cord
						Note: To be supplied not one part but as a pair of P.W.B. ass'y No. 911658B,FA and P.W.P. Kit ass'y No. 9116580,FA for LED and photographic transistors of PB00 and PB50 circuit board which characteristics are stricly chosen. Do not mixed up with parts of other circuit board because all parts are used as a pair.
						PC00-PHONO OUTPUT-2 CIRCUIT BOARD
PC00	911.606-B.nec	1	1	1	1	P.W. Board, phono Output-2
132-1	911.664-B.nec	1	1	1	1	P.W. Board Assembly
						PC50-TRACKING SENSOR CIRCUIT BOARD
PC50	911.606-A.nec	1	1	1	1	P.W. Board, Tracking Sensor
132-2	911.664-A.nec	1	1	1	1	P.W. Board Assembly

REF. DESIG.	PART NO.	QUANTITY E	N	T	A	DESCRIPTION
129	911.6320.nec	1	1	1	1	Connective Cord
						Note: To be supplied not one part but as P.W.B. Kit ass'y No. 911664 for photographic transistors of PC50 circuit board. Do not mixed up with parts of other circuit board because parts of the transistors are used as a pair.
						P200-STROBO L.E.D. CIRCUIT BOARD
P200	912.5100.nec	1	1	1	1	P.W. Board, Strobe L.E.D.
134	912.5990.nec	1	1	1	1	P.W. Board Assembly
D123	899.9080.nec	1	1	1	1	L.E.D. AA-55345
D124	899.9080.nec	1	1	1	1	L.E.D. AA-55346
131	912.5980.nec	1	1	1	1	Connective Cord
						PD00-FUNCTION SWITCH CIRCUIT BOARD
PD00	873.4661.nec	1	1	1	1	P.W. Board, Board Function SW.
135-1	873.495-A.nec	1	1	1	1	P.W. Board Assembly
VR201	911.386-3.nec	1	1	1	1	5kΩ(B) Variable, Pitch
SW202	912.5950.nec	1	1	1	1	Push Switch
SW203	912.5950.nec	1	1	1	1	Push Switch
SW204	912.5950.nec	1	1	1	1	Push Switch
SW205	912.5950.nec	1	1	1	1	Push Switch
SW206	912.5950.nec	1	1	1	1	Push Switch
SW207	911.5520.nec	1	1	1	1	Push Switch
SW208	911.5520.nec	1	1	1	1	Push Switch
127	912.5970.nec	1	1	1	1	Connective Cord
						PD50-FUNCTION L.E.D. CIRCUIT BOARD
PD50	873.466-2.nec	1	1	1	1	P.W. Board, Function L.E.D.
135-2	873.495-B.nec	1	1	1	1	P.W. Board Assembly
D201	897.8240.nec	1	1	1	1	L.E.D. GL-9PR2
D202	912.0310.nec	1	1	1	1	L.E.D. GL-9NG2
D203	912.0310.nec	1	1	1	1	L.E.D. GL-9NG2

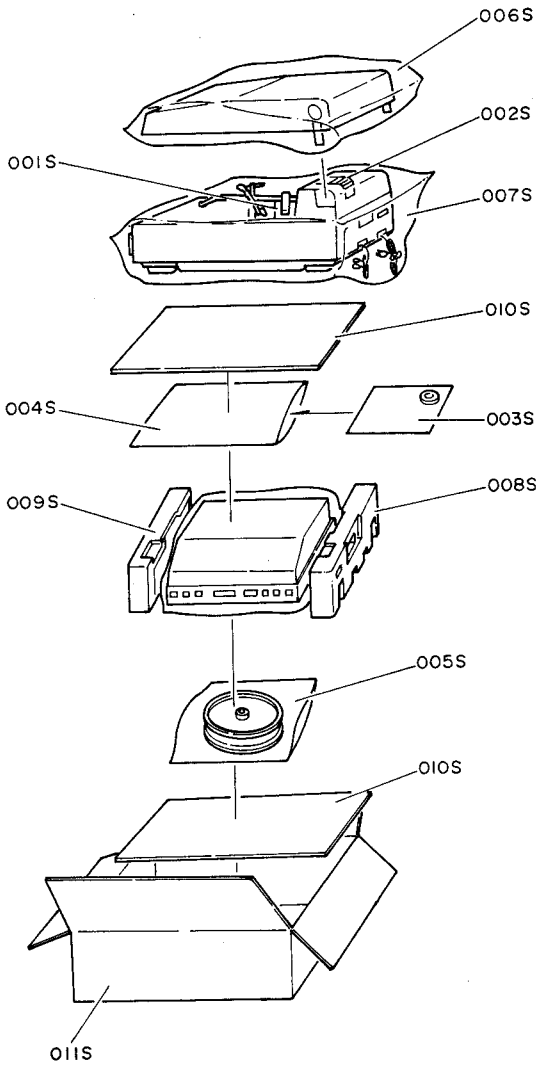
REF. DESIG.	PART NO.	QUANTITY E	N	T	A	DESCRIPTION
D204	912.0310.nec	1	1	1	1	L.E.D. GL-9NG2
D205	897.8240.nec	1	1	1	1	L.E.D. GL-9PR2
126	912.5960.nec	1	1	1	1	Connective Cord
1	911.619-1.nec	1	1	1	1	Bracker Assembly, Tone Arm
A						Gear Assembly, Worm
2	911.5970.nec	1	1	1	1	Gear, Worm
3	897.6750.nec	1	1	1	1	Sustainer
4	021.0405.nec	1	1	1	1	Washer, Polyslider $\phi 2.1 x \phi 4 x ^t 0.5$
5	897.6770.nec	1	1	1	1	Pulley, Worm
6	873.145-1.nec	1	1	1	1	Buffer
7	706.2010.nec	1	1	1	1	DC Motor, Tone Arm Drive
8	911.3540.nec	1	1	1	1	Clamper, Motor
9	3x6.TPTO.nec	1	1	1	1	Cup Tite Screw $\phi 3x6$
10	897.8130.nec	1	1	1	1	Pulley, Motor
11	2x3.FT00.nec	1	1	1	1	Set Screw, M2x3
12	911.5980.nec	1	1	1	1	Belt, Worm
13	03E.0000.nec	10	10	10	10	R.G. Ring, E Type $\phi 3$
14	046.1005.nec	2	2	2	2	Washer, Polyslider $\phi 4.6 x \phi 10 x ^t 0.5$
B	911.599-1.nec	1	1	1	1	Gear Assembly, Worm Wheel
15	911.328-1.nec	1	1	1	1	Pulley, Drum
16	911.3270.nec	1	1	1	1	Gear, Drum
17	911.6000.nec	1	1	1	1	Bracket Assembly, Pulley
18	911.3290.nec	2	2	2	2	Pulley, Wire Rope
19	911.6010.nec	1	1	1	1	Spring
20	911.6030.nec	2	2	2	2	Guide
21	04x.080S.nec	2	2	2	2	Washer, Polyslider $\phi 4 x \phi 8 x ^t 0.5$
22	M30.0000.nec	4	4	4	4	Flange Nut M3
23	912.728C.nec	1	1	1	1	Stylus, N1510F
24	911.3330.nec	1	1	1	1	Lever, Lifter
25	848.6020.nec	1	1	1	1	Chassis, PU Base
26	911.7620.nec	1	1	1	1	Guide Assembly
27	911.5150.nec	1	1	1	1	String Assembly, Wire Rope
28	3x1.6BT0.nec	1	1	1	1	P.H.B. Tite Screw P3x10
29	911.6070.nec	1	1	1	1	Shaft Assembly, Lifte
29-1	911.3350.nec	1	1	1	1	Shaft, Lifter
29-2	16x.1600.nec	1	1	1	1	Spring Pin $\phi 1.6 x 16$
30	910.0730.nec	1	1	1	1	Spring, Lifter
31	852.7280.nec	1	1	1	1	Escutcheon, Front
32	911.4350.nec	1	1	1	1	Spring, Lifter
33	911.3340.nec	1	1	1	1	Retainer
34	912.2150.nec	1	1	1	1	Screw, M2.6x15

REF. DESIG.	PART NO.	QUANTITY E	N	T	A	DESCRIPTION
35	852.7300.nec	1	1	1	1	Tone Arm, Gold (with Stylus)
36	M10.0000.nec	1	1	1	1	Nut, PU M10
37	911.6110.nec	1	1	1	1	Bracket Assembly, Solenoid
38	911.6120.nec	1	1	1	1	Solenoid Coil
39	899.9960.nec	1	1	1	1	Mini Switch Up/Down
40	911.5540.nec	1	1	1	1	Shield
41	873.5320.nec	2	2	2	2	Shield, Cabi Cover
42	TOW.3000.nec	2	2	2	2	T.L. Washer TOW3
43	3x6.BT00.nec	13	13	13	13	P.H.B. Tite Screw P3x6
44	911.3560.nec	1	1	1	1	Sifter
45	911.6130.nec	1	1	1	1	Spring, Sifter
46	312.BT00.nec	3	3	3	3	P.H.B. Tite Screw P3x12
47	911.6150.nec	1	1	1	1	Bracket Assembly, Guide
48	873.5550.nec	1	1	1	1	P.W.H. Circuit Board Ass'y
51	3x8.BT00.nec	17	17	17	17	P.H.B. Tite Screw P3x8
52	911.6460.nec	4	4	4	4	Buffer, Guide
53	852.7670.nec	1	1	1	1	Chassis Assembly, Main
54	911.6340.nec	4	4	4	4	Screw
55	911.5200.nec	4	4	4	4	Leg
56	705.8380.nec	1	1	1	1	Phono Motor
57	912.6180.nec	1	1	1	1	Sustainer Assembly, T.T. Shaft
58	912.6500.nec	1	1	1	1	Spindle
59	910.8310.nec	1	1	1	1	Pin, Spindle
60	873.5990.nec	1				Power Transformer
60	873.5980.nec		1			Power Transformer
60	873.6430.nec			1	1	Power Transformer
61	911.3480.nec	2	2	2	2	Buffer, Transformer
62	41x.5311.nec	2	2	2	2	Bush ϕ4.1xϕ5.3xℓ11
63	911.3490.nec	2	2	2	2	Clamper
64	420.CT00.nec	2	2	2	2	C Tite Screw P4x20
65	912.5050.nec	1	1	1	1	Knob, volume
66	911.3550.nec	1	1	1	1	Buffer
67	873.4840.nec	1	1	1	1	Movement
68	911.3460.nec	1	1	1	1	Holder
72	912.6190.nec	1	1	1	1	Knob, Power Switch
73	912.5040.nec	1	1	1	1	Button, Play
74	912.5030.nec	6	6	6	6	Button, Operation
75	911.344-1.nec	1	1	1	1	Holder
76	911.9960.nec	1	1	1	1	Protector
78	911.3440.nec	3	3	3	3	Holder

REF. DESIG.	PART NO.	QUANTITY E	N	T	A	DESCRIPTION
79	320.BT00.nec	3	3	3	3	P.H.B. Tite Screw P3x20
80	911.3620.nec	1	1	1	1	Clamper
81	849.022-1.nec	1	1	1	1	
82	912.5020.nec	1	1	1	1	Cover
83	911.5300.nec	1	1	1	1	Shield, Case
84	873.4650.nec	1	1	1	1	Window
85	912.5060.nec	1	1	1	1	Retainer
86	898.52-40.nec	1	1	1	1	Reflector
87	325.TPT0.nec	1	1	1	1	Cup Tite Screw P3x25
88	912.5940.nec	1	1	1	1	Clamper
89	852.727-1.nec	1	1	1	1	Cover
90	316.TPT0.nec	9	9	9	9	Cup Tite Screw
91	912.6120.nec	1	1	1	1	Belt, Turn Table
92	620.1090.nec	1	1	1	1	Turn Table Platter
93	873.144-1.nec	1	1	1	1	Sheet
94	852.729-1.nec	1	1	1	1	Dust cover
95	911.622-5.nec	1	1	1	1	Hinge Assembly, (L)
96	911.622-6.nec	1	1	1	1	Hinge Assembly, (R)
97		1	1	1	1	Cover, Hinge
97		1	1	1	1	Cover, Hinge
98	260.000Q.nec	2	2	2	2	O.C.H. Tap Screw ϕ2.6x6
99	890.8760.nec	1	1	1	1	Rec. Adaptor
100	316.FM00.nec	1	1	1	1	H. Head Bolt M3x16
101	3x8.TPT0.nec	5	5	5	5	Cup Tite Screw P3x8
102	911.4660.nec	2	2	2	2	Clamper
105	02E.0000.nec	3	3	3	3	R.G. Ring, E Type ϕ2
106	911.3510.nec	1	1	1	1	Holder, T Sensor
107	911.6090.nec	1	1	1	1	Spring
108	911.3530.nec	1	1	1	1	Spacer
109	898.1530.nec				1	AC Power Cord
	876.913-2.nec			1		AC Power Cord
	890.208-2.nec	1	1			AC Power Cord
110	870.7710.nec	1	1	1	1	Connective Cord, Output
111	911.3450.nec	1	1	1	1	Holder, Control P.W. Board
112	890.7550.nec	3	3	3	3	Clamp
113	033.L600.nec	3	3	3	3	Tube ϕ3.3xℓ60
114	894.4080.nec	4	4	4	4	Clamper
115	04L.0000.nec	1	1	1	1	Lug ϕ4
116	912.1130.nec	4	4	4	4	Washer, Lifter
117		1	1	1	1	Tape, UL. Black
118	911.5210.nec	1	1	1	1	Spring

REF. DESIG.	PART NO.	QUANTITY				DESCRIPTION	
		E	N	T	A		
119	3x4.TP00.nec	2	2	2	2	Cup Tite Screw	P3x4
122	3x5.FM00.nec	1	1	1	1	P.H.M. Screw	P3x5
123	911.5310.nec	1	1	1	1	Shield, Chassis	
124	911.6390.nec	2	2	2	2	Bush	
126	912.5960.nec	1	1	1	1	Connective Cord	
127	912.5970.nec	1	1	1	1	Connective Cord	
128	911.6310.nec	1	1	1	1	Connective Cord	
129	911.6320.nec	1	1	1	1	Connective Cord	
130	912.6210.nec	1	1	1	1	Connective Cord	
131	912.5980.nec	1	1	1	1	Connective Cord	
133	632.173-1.nec	1	1	1	1	Control Circuit Board Ass'y	
136	894.021-5.nec	1	1	1	1	Pulley, Phono Motor	
137	M23.T000.nec	1	1	1	1	Set Screw, F.P.	M2x3
138	912.5070.nec	1	1	1	1	Bracket, Phono Motor	
139	263.FM00.nec	3	3	3	3	P.H.M. Screw	P2.6x3
140	702.2300.nec	3	3	3	3	Buffer, Phono Motor	
141		6	6	6	6	Fiber Washer	$\phi 4.7 \times \phi 13 \times t1$
142		2	2	2	2	Fiber Washer	$\phi 4.7 \times \phi 13 \times t1$
143		1	1	1	1	Identification Label	
144		1	1	1	1	Serial No. Card	
145		1	1	1	1	Label, Caution	
146	912.6240.nec	1	1	1	1	Screw	

PACKING MATERIALS



REF. DESIG.	PART NO.	QUANTITY				DESCRIPTION
		E	N	T	A	
001S	898.1470.nec	1	1	1	1	Pad., Pick Up
003S	913.1910.nec	1	1	1	1	Instruction
004S	230.3400.nec	1	1	1	1	Polyethy Bag W230xℓ340
005S	340.5700.nec	1	1	1	1	Polyethy Bag W340xℓ570 for TT/TT Sheet
006S		1	1	1	1	Protector, Dust Cover
007S		1	1	1	1	Protector, Unit
	852.7310.nec	1	1	1	1	Cushion Assembly
008S	852.731-R.nec	1	1	1	1	Cushion (R)
009S	852.731-L.nec	1	1	1	1	Cushion (L)
	852.732-1.nec	1	1	1	1	Packing Case Assembly
010S	852.732-1.Bne	2	2	2	2	Reinforcement
011S	852.731-1.Ane	1	1	1	1	Packing Case
	852.732-1.Cne	1	1	1	1	Pad